OPTIMUM®
MASCHINEN - GERMANY

Operating manual

Version 1.1.3

Drilling machine

OPTI drill® DH 24BV — Item no. 302 0420

OPTI drill® DH 28BV — Item no. 302 0430

OPTI drill® DH 34BV — Item no. 302 0440

OPTI drill® DH 40BV — Item no. 302 0450

Table of contents

DH24BV_DH28BV_DH34BV_DH40BV_GBIVZ.fm

Preface

Dear customer,

Thank you very much for purchasing a product made by OPTIMUM.

OPTIMUM metal working machines offer a maximum of quality, technically optimum solutions and convince by an outstanding price performance ratio. Continuous enhancements and product innovations guarantee state-of-the-art products and safety at any time.

Before commissioning the machine please thoroughly read these operating instructions and get familiar with the machine. Please also make sure that all persons operating the machine have read and understood the operating instructions beforehand.
Keep these operating instructions in a safe place nearby the machine.

Information

The operating instructions include indications for safety-relevant and proper installation, operation and maintenance of the machine. The continuous observance of all notes included in this manual guarantee the safety of persons and of the machine.

The manual determines the intended use of the machine and includes all necessary information for its economic operation as well as its long service life.

In the paragraph "Maintenance" all maintenance works and functional tests are described which the operator must perform in regular intervals.

The illustration and information included in the present manual can possibly deviate from the current state of construction of your machine. Being the manufacturer we are continuously seeking for improvements and renewal of the products. Therefore, changes might be performed without prior notice. The illustrations of the machine may be different from the illustrations in these instructions with regard to a few details. However, this does not have any influence on the operability of the machine.
Therefore, no claims may be derived from the indications and descriptions. Changes and errors are reserved!

Your suggestion with regard to these operating instructions are an important contribution to optimising our work which we offer to our customers. For any questions or suggestions for improvement, please do not hesitate to contact our service department.

If you have any further questions after reading these operating instructions and you are not able to solve your problem with a help of these operating instructions, please contact your specialised dealer or directly the company OPTIMUM.

Optimum Maschinen Germany GmbH

Dr.- Robert - Pfleger - Str. 26

D-96103 Hallstadt

Mail: info@optimum-maschinen.de

Internet: www.optimum-maschinen.com

1 Safety

Glossary of symbols

☞	provides further instructions
➜	calls on you to act
❍	enumerations

This part of the operating instructions

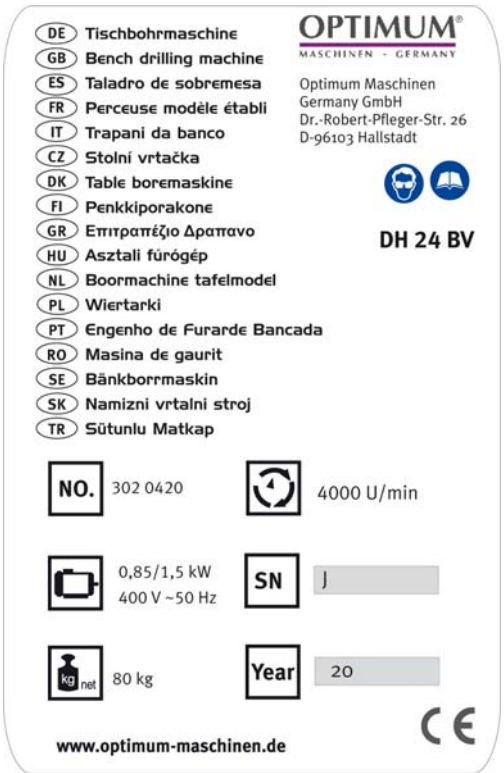
- ❍ explains the meaning and use of the warning notes included in these operating instructions,
- ❍ defines the intended use of the drilling machine,
- ❍ points out the dangers that might arise for you or others if these instructions are not observed,
- ❍ informs you about how to avoid dangers.

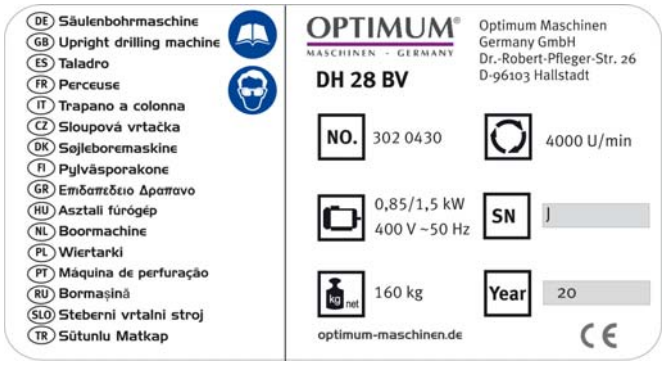
In addition to these operation instructions, please observe

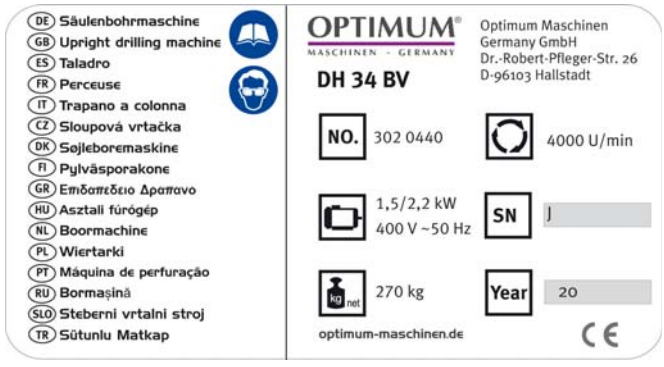
- ❍ the applicable laws and regulations,
- ❍ the statutory provisions for accident prevention,
- ❍ the prohibition, warning and mandatory signs as well as the warning labels on the drilling machine.

Always keep this documentation close to the drilling machine.

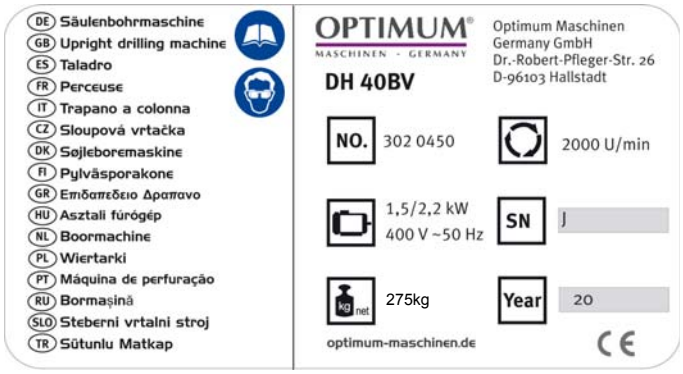
1.1 Rating plates







DHBV_GB_1.fm



INFORMATION

If you are unable to rectify an issue using these operating instructions, please contact us for advice:

Optimum Maschinen Germany GmbH
Dr. Robert-Pfleger-Str. 26

D-96103 Hallstadt

Email: info@optimum-maschinen.de

1.2 Safety instructions (warning notes)

1.2.1 Classification of hazards

We classify the safety warnings into different categories. The table below gives an overview of the classification of symbols (ideogram) and the warning signs for each specific danger and its (possible) consequences.

Symbol	Warning alert	Definition / consequence
	**DANGER!**	Impending danger that will cause serious injury or death to people.
	WARNING!	A danger that can cause serious injury or death.
	CAUTION!	A danger or unsafe procedure that can cause personal injury or damage to property.
	**ATTENTION!**	Situation that could cause damage to the drilling machine and products and other types of damage. No risk of injury to people.
	**Information**	Practical tips and other important or useful information and notes. No dangerous or harmful consequences for people or objects.

In case of specific dangers, we replace the pictogram with


general danger


with a warning of


injury to hands,


hazardous electrical voltage,

or


rotating parts.

1.2.2 Other pictograms


Warning: danger of slipping!


Warning: risk of stumbling!


Warning: hot surface!


Warning: biological hazard!


Warning: automatic start-up!


Warning tilting danger!


Warning: suspended loads!


Caution, danger of explosive substances!


Activation forbidden!


Use ear protection!


Read the operating instructions before commissioning!


Disconnect the mains plug!


Wear protective glasses!


Wear protective gloves!


Wear protective boots!


Wear a protective suit!

DHBV_GB_1.fm

1.3 Intended use

WARNING!

In the event of improper use, the drilling machine

- **will endanger personnel,**
- **will endanger the machine and other material property of the operating company,**

the correct function of the drilling machine may be affected.

The drilling machine is designed and manufactured to be used in a non-explosive environment. The drilling machine is designed and manufactured for holes in cold metals or other non flammable materials or that not constitute a health hazard using a rotating filing-stripping tool that has a number of grooves for collecting the filings.

If the drilling machine is used in any way other than described above, modified without the approval of the company Optimum Maschinen Germany GmbH, then the drilling machine is being used improperly.

We will not be held liable for any damages resulting from any operation which is not in accordance with the intended use.

We expressly point out that the guarantee or CE conformity will expire due to any constructive technical or procedural changes which had not been performed by the company Optimum Maschinen Germany GmbH.

It is also part of intended use that you

- observe the limits of the drilling machine,
- the operating manual is observed,
- the inspection and maintenance instructions are observed.

☞ Technical data on page 18

WARNING!

Extremely severe injuries.

It is forbidden to make any modifications or alternations to the operation values of the drilling machine! They could endanger the personnel and cause damage to the drilling machine.

1.4 Reasonably foreseeable misuses

Any other use other than that specified under "Intended use" or any use beyond the described use shall be deemed as non-intended use and is not permissible.

Any other use has to be discussed with the manufacturer.

It is only allowed to process metal, cold and non-inflammable materials with the drilling machine.

In order to avoid misuse, it is necessary to read and understand the operating instructions before first commissioning.

Operators must be qualified.

1.4.1 Avoiding misuse

➜ Use of suitable cutting tools.

➜ Adapting the speed adjustment and feed to the material and workpiece.

➜ Clamp workpieces firmly and vibration-free.

ATTENTION!

The workpiece is always to be fixed by a machine vice, jaw chuck or by another appropriate clamping tool such as for the clamping claws.

WARNING!

Risk of injury caused by workpieces flying off.

Clamp the workpiece in the machine vice. Make sure that the workpiece is firmly clamped in the machine vice resp. that the machine vice is firmly clamped on the machine table.

- ➜ Use cooling and lubricating agents to increase the durability of the tool and to improve the surface quality.
- ➜ Clamp the cutting tools and workpieces on clean clamping surfaces.
- ➜ Sufficiently lubricate the machine.
- ➜ Correctly adjust the bearing clearance and the guidings.

It is recommended:

- ➜ Insert the drill in a way that it is exactly positioned between the three clamping jaws of the quick action chuck.

When drilling make sure that

- ➜ the suitable speed is set depending on the diameter of the drill,
- ➜ the pressure must only be such that the drill can cut without load
- ➜ in case of too strong pressure the drill will get worn early or even might break resp. get jammed in the hole. If the drill gets jammed immediately stop the main motor by pressing the emergency stop button,
- ➜ for hard materials, e.g. steel, use commercial cooling / lubricating agents,
- ➜ generally always drive the turning spindle out of the workpiece.

1.5 Possible dangers caused by the drilling machine

The drilling machine is state-of-the-art.

Nevertheless, there is a residual risk as the drilling machine operates with

- ❍ at high speeds,
- ❍ rotating parts,
- ❍ electrical voltage and currents.

We have used construction resources and safety techniques to minimize the health risk to personnel resulting from these hazards.

If the drilling machine is used and maintained by personnel who are not duly qualified, there may be a risk resulting from incorrect or unsuitable maintenance of the drilling machine.

INFORMATION

Everyone involved in the assembly, commissioning, operation and maintenance must

- ❍ be duly qualified,
- ❍ strictly follow these operating instructions.

In the event of improper use

- ❍ there may be a risk to personnel,
- ❍ there may be a risk to the machine and other material values,
- ❍ the correct function of the drilling machine may be affected.

Always disconnect the drilling machine, and upright drill if cleaning or maintenance work is being carried out.

WARNING!

The drilling machine may only be used with functional safety devices.

Disconnect the drilling machine immediately, whenever you detect a failure in the safety devices or when they are not fitted!

DHBV_GB_1.fm

All additional devices installed by the operator have to be equipped with the prescribed safety devices.

This is your responsibility being the operating company!

☞ **Safety devices on page 13**

1.6 Qualification of personnel

1.6.1 Target group

This manual is addressed to

- the operating companies,
- the operators,
- the maintenance personnel.

Therefore, the warning notes refer to both, operation and maintenance personnel of the drilling machine.

Determine clearly and explicitly who will be responsible for the different activities on the machine (operation, maintenance and repair).

Unclear responsibilities constitute a safety risk!

Always disconnect plug of the drilling machine from the electrical power supply. This will prevent it from being used by unauthorized persons.

The qualifications of the personnel for the different tasks are mentioned below:

Operator

The operator is instructed by the operating company about the assigned tasks and possible risks in case of improper behaviour. Any tasks which need to be performed beyond the operation in standard mode must only be performed by the operator, if so indicated in these instructions and if the operator has been expressively commissioned by the operating company.

Qualified electrician

With professional training, knowledge and experience as well as knowledge of respective standards and regulations, qualified electricians are able to perform work on the electrical system and recognise and avoid any possible dangers.

Qualified electricians have been specially trained for the working environment, in which they are working and know the relevant standards and regulations.

Qualified personnel

Thanks to professional training, knowledge and experience as well as knowledge of relevant regulations the qualified personnel is able to perform the assigned tasks and to independently recognise and avoid any possible dangers themselves.

Instructed person

Instructed persons were instructed by the operating company regarding the assigned tasks and any possible risks of improper behaviour.

1.6.2 Authorized personnel

WARNING!

Inappropriate operation and maintenance of the drilling machine constitutes a danger for the personnel objects and the environment.

Only authorized staff may operate the drilling machine!

Persons authorized to operate and maintain should be trained technical personnel and instructed by the ones who are working for the operating company and for the manufacturer.

Obligations of the operating company

Obligations of the operating company

- train the personnel,
- instruct the personnel in regular intervals (at least once a year) on
  - all safety standards that apply to the machine,
  - the operation,
  - generally accepted engineering standards.
- check the personnel‘s knowledge level,
- document the trainings/instructions,
- require personnel to confirm participation in training/instructions by means of a signature,
- check whether the personnel is working in a safety and risk-conscious manner and following the operating instructions.
- define and document the inspection deadlines for the machine in accordance with the Factory Safety Act and perform an operational risk analysis in accordance with the Work Safety Act.

Obligations of the operator

Obligations of the operator

- have obtained a training regarding the handling of the drilling machine,
- know the function and mode of action,
- before taking the machine in operation
  - have read and understood the operating manual,
  - be familiar with all safety devices and instructions.

Additional requirements apply for work on the following machine components:

Additional requirements regarding the qualification

- Electrical parts or operating agents: shall only be performed by an electrician or under the guidance and supervision of an electrician.
- Before starting work on electrical parts or operating agents, following measures are to be performed in the following order:

➜ disconnect all poles

➜ secure against restarting

➜ check that there is no voltage

1.7 Operator positions

The operator’s position is in front of the drilling machine.

DHBV_GB_1.fm

1.8 Safety measures during operation

CAUTION!

Risk due to inhaling dusts and mist hazardous to health.

Dependent on the material which need to be processed and the used auxiliaries dusts and mist may be caused which might impair you health.

Make sure that the generated health hazardous dusts and mist are safely sucked off at the point of origin and is dissipated or filtered from the working area. To do so, use a suitable extraction unit.

CAUTION!

Risk of fire and explosion by using flammable materials or cooling lubricants.

Before processing inflammable materials (e.g. aluminium, magnesium) or using inflammable auxiliary materials (e.g. spirit) it is necessary to take additional preventive measures in order to safely avoid health risks.

1.9 Safety devices

Use the drilling machine only with properly functioning safety devices.

Stop the drilling machine immediately if there is a failure on the safety device or if it is not functioning for any reason.

It is your responsibility!

If a safety device has been activated or has failed, the drilling machine must only be used if you

- the cause of the fault has been eliminated,
- you have verified that there is no danger to personnel or objects.

WARNING!

If you bypass, remove or deactivate a safety device in any other way, you are endangering yourself and other personnel working with the drilling machine. The possible consequences are:

- **injuries may occur due to workpiece or parts of workpieces flying off,**
- **contact with rotating parts,**
- **fatal electrocution,**

The drilling machine machine includes the following safety devices:

- an EMERGENCY STOP push button,
- a drilling table with T-slots to fix the workpiece or a vice,
- a drill chuck guard, in order to prevent interference with the rotating tool.

WARNING!

The separating protective equipment which is made available and delivered together with the machine is designed to reduce the risk of workpieces or fractions of them which being expelled, but not to remove them completely. Always work carefully and observe the limit values of your chipping process.

1.10 Safety check

Check the drilling machine before each start-up or at least once per shift. Inform the person responsible immediately of any damage, defects or changes in the operating function.

Check all safety devices

- at the beginning of each shift (with the machine stopped),
- once a week (with the machine in operation),
- after all maintenance and repair work.

Check that prohibition, warning and information signs and the labels on the drilling machine.

- are legible (clean them, if necessary),
- are complete (replace if necessary).

INFORMATION

Organise the checks according to the following table;

General check		
Equipment	**Check**	**OK**
Protective covers	Mounted, firmly bolted and not damaged	
Signs, Markers	Installed and legible	
Date:	**checked by (signature):**	

Functional check		
Equipment	**Check**	**OK**
EMERGENCY-STOP push button	After actuating an EMERGENCY STOP push button the drilling machine must be switched off.	
Drill chuck protection	The drilling machine must only be switched on, if the drill chuck protection is closed. The engine must switch off when the drill chuck protection is opened during operation.	
Date:	**checked by (signature):**	

1.11 EMERGENCY-STOP push button

ATTENTION!

Also after actuating the EMERGENCY-STOP switch, the drilling spindle is turning - depending on the previously selected speed - for a few seconds more.

1.11.1 Main switch

In the "0" position, the lockable main switch can be secured against accidental or non-authorised switching on by means of a padlock.

The power supply is interrupted by switchingoff the main plug.

Except for the areas marked by the pictogram in the margin. In these areas there might be voltage, even if the main switch is switched-off.

DHBV_GB_1.fm

WARNING!

Dangerous voltage even if the main switch is switched off.

The areas marked by the pictogram might contain live parts, even if the main switch is switched off.

1.12 Drilling table

Seats for T-slots are attached to the drilling table.

WARNING!

Risk of injury due to workpieces flying off at high speed. Securely fix the workpiece on the drilling table.

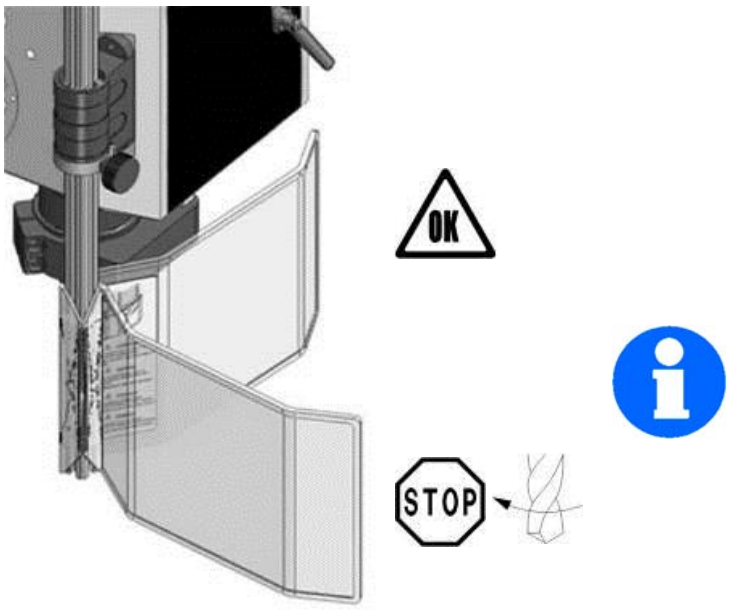
1.13 Drill chuck protection

Adjust the protective equipment to the correct height before you start working.
To do so, detach the clamping screw, adjust the required height and re-tighten the clamping screw.

A switch is integrated in the fixture of the spindle protection which monitors that the cover is closed.

INFORMATION

You cannot start the machine if the drill chuck protection is not closed.



Img. 1-1: Drill chuck protection

1.14 Personal protective equipment

For certain work individual protection gear as protective equipment. This includes:

- Safety helmet,
- protective glasses or face guard,
- protective gloves,
- safety shoes with steel toe caps,
- ear protection.

Before starting work make sure that the required personnel protective equipment is available at the work place.

CAUTION!

Dirty or contaminated personnel protective equipment can cause illness.

Clean your personal protective equipment

- **after each use,**
- **regularly once a week.**

DHBV_GB_1.fm

Personal protective equipment for special works

Protect your face and your eyes: Wear a safety helmet with facial protection when performing works where your face and eyes are exposed to hazards.

Use protective gloves when handling pieces with sharp edges.

Wear safety shoes when you assemble, disassemble or transport heavy components.

1.15 Safety during operation

We specifically point out the dangers when describing the work with and on the drilling machine.

WARNING!

Before switching on the drilling machine make sure that there are

- **no dangers generated for persons,**
- **no objects are damaged.**

Avoid any unsafe work methods:

- Make sure that nobody is endangered by your work.
- The instructions mentioned in these operating instructions have to be strictly observed during assembly, operation, maintenance and repair.
- Do not work on the drilling machine, if your concentration is reduced, for example, because you are taking medication.
- Observe the accident prevention regulations issued by your Employers Liability Insurance Association or other supervisory authorities responsible for your company.
- Inform the supervisor about all hazards or faults.
- Stay on the drilling machine until the machine completely stopped moving.
- Use the prescribed personnel protective equipment. Make sure to wear a well-fitting work suit and, if necessary, a hairnet.
- Do not use protective gloves when drilling.

1.16 Safety during maintenance

Inform the operators in good time of any maintenance and repair works.

Report all safety relevant changes and performance details of the drilling machine or their operational behaviour. Any changes must be documented, the operating instructions updated and machine operators instructed accordingly.

1.17 Disconnecting and securing the drilling machine

Switch off the drilling machine with the main switch and secure the main switch with a padlock- against unauthorised switching-on or switching-on by accident.

All machine parts as well as any dangerous voltages are switched off. Excepted are only the positions which are marked with the adjoining pictogram.

1.18 Mechanical maintenance work

Reinstall all protection and safety devices after any maintenance work once the work has been completed.This includes:

- covers,
- safety instructions and warning signs,
- grounding cables.

Check if they are working properly!

DHBV_GB_1.fm

1.19 Accident report

Inform your supervisors and Optimum Maschinen Germany GmbH immediately in the event of accidents, possible sources of danger and any actions which almost led to an accident (near misses).

There are many possible causes for "near misses".

The sooner they are notified, the quicker the causes can be eliminated.

1.20 Electrical system

Have the machine and/or the electric equipment checked regularly. Immediately eliminate all defects such as loose connections, defective wires, etc.

A second person must be present during work on live components to disconnect the power in the event of an emergency. Disconnect the machine immediately if there is a malfunction in the power supply!

Comply with the required inspection intervals in accordance with the factory safety directive, operating equipment inspection DGUV, formerly BVG.

The operator of the machine must ensure that the electrical systems and operating equipment are inspected with regards to their proper condition, namely,

- by a qualified electrician or under the supervision and direction of a qualified electrician, prior to initial commissioning and after modifications or repairs, prior to recommissioning
- and at certain intervals.

The deadlines must be set so that arising, foreseeable defects can be detected in time.

The relevant electro-technical rules must be followed during the inspection.

The inspection prior to initial commissioning is not required if the operator receives confirmation from the manufacturer or installer that the electrical systems and operating equipment comply with the accident prevention regulations, see conformity declaration.

Permanently installed electrical systems and operating equipment are considered constantly monitored if they are continually serviced by qualified electricians and inspected by means of measurements in the scope of operation (e.g. monitoring the insulation resistance).

1.21 Inspection deadlines

Define and document the inspection deadlines for the machine in accordance with the Factory Safety Act and perform an operational risk analysis in accordance with the Work Safety Act. Also use the inspection intervals in the maintenance section as reference values.

2 Technical data

The following information represents the dimensions and indications of weight and the manufacturer‘s approved machine data for following stated machines.

DH 24 BV	DH 28 BV	DH 34 BV	DH 40 BV
2.1 Electrical connection			
3x400V ~50 Hz	3x400V ~50 Hz	3x400V ~50 Hz	3x400V ~50 Hz
2.2 Power drive motor			
2-stage motor ~ 50 Hz connection			
0.85 KW at 2000 min^{-1} , 230V 1.5 kW at 4000 min^{-1} , 400V	0.85 KW at 2000 min^{-1}, 230V 1.5 kW at 4000 min^{-1} , 400V	1.5 KW at 2000 min^{-1} , 230V 2.2 kW at 4000 min^{-1} , 400V	1.5 KW at 1000 min^{-1} , 230V 2.2 kW at 2000 min^{-1} , 400V
2-stage motor ~ 60 Hz connection			
0.85 KW at 2400 min^{-1} , 230V 1.5 kW at 4800 min^{-1} , 400V	0.85 KW at 2400 min^{-1}, 230V 1.5 kW at 4800 min^{-1} , 400V	1.5 KW at 2400 min^{-1} , 230V 2.2 kW at 4800 min^{-1} , 400V	1.5 KW at 1200 min^{-1} , 230V 2.2 kW at 2400 min^{-1} , 400V
2.3 Drilling capacity in steel			
St 37 (S235JR, 1.0038)			
24mm	28mm	36mm	40mm
2.4 Spindle seat			
MT2	MT3	MT4	
2.5 T-slots - size			
Drilling table 14mm	Drilling table 14mm	Drilling table 14mm	
-	Machine foot 14mm	Machine foot 14mm	
2.6 Table size			
300 x 280mm	340 x 360mm	420 x 400mm	
2.7 Spindle stroke			
85mm	105mm	160mm	
2.8 Throat depth			
165mm	200mm	285mm	
2.9 Machine height			
1000mm	1780mm	1960mm	
2.10 Column diameter			
80mm	92mm	115mm	

DHBV_GB_2.fm

DH 24 BV	DH 28 BV	DH 34 BV	DH 40 BV
2.11 Distance spindle - table			
max. 515mm	max. 860mm	max. 790mm	
2.12 Dimensions machine foot			
447 x 300mm	527 x 350mm	637 x 400	
2.12.1 Working surface machine foot			
280 x 260mm	320 x 320mm	390 x 400mm	
2.13 Weight of machine [kg]			
115kg	152kg	270kg	275kg
2.14 Spindle speeds (Motor + Gear) ~ 50 Hz			
300 - 4,000 min^{-1}	300 - 4,000 min^{-1}	300 - 4,000 min^{-1}	150 - 2,000 min^{-1}
2.15 Spindle speeds (Motor + Gear) ~ 60 Hz			
330 - 4,800 min^{-1}	330 - 4,800 min^{-1}	330 - 4,800 min^{-1}	180 - 2,400 min^{-1}
Speed steps			
2	2	2	2
2.16 Environmental conditions temperature			
5 - 35 °C			
Relative humidity 25 - 80%			

Emissions

The generation of noise emitted by the drilling-milling machine is 76 to 80 dB(A). The sound power level is 88 to 92 dB(A). If the drilling machine is installed in an area where various machines are in operation, the noise exposure (immission) on the operator of the drilling machine at the working place may exceed 80 dB(A).

INFORMATION

This numerical value was measured on a new machine under the operating conditions specified by the manufacturer. The noise behaviour of the machine might change depending on the age and wear of the machine. Furthermore, the noise emission also depends on production engineering factors, e.g. speed, material and clamping conditions.

INFORMATION

The specified numerical value represents the emission level and does not necessarily a safe working level.

Though there is a dependency between the degree of the noise emission and the degree of the noise disturbance it is not possible to use it reliably to determine if further precaution measures are required or not.

The following factors influence the actual degree of the noise exposure of the operator:

- **Characteristics of the working area, e.g. size or damping behaviour,**
- other noise sources, e.g. the number of machines,
- other processes taking place in proximity and the period of time, during which the operator is exposed to the noise.

Furthermore, it is possible that the admissible exposure level might be different from country to country due to national regulations. This information about the noise emission should, however, allow the machine operator to evaluate the hazards and risks more easily.

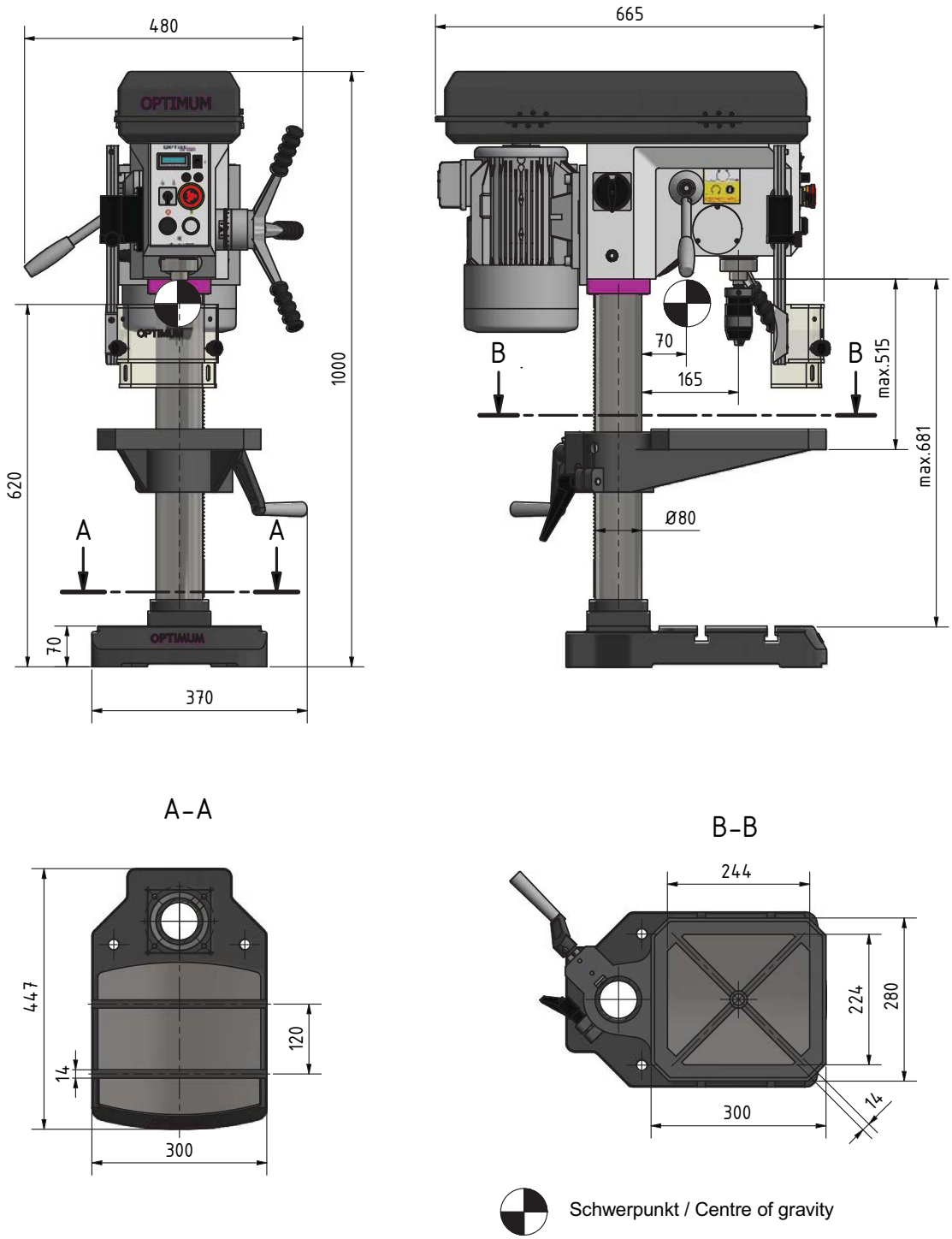
CAUTION!

Depending on the overall noise exposure and the basic threshold values, machine operators must wear appropriate hearing protection.

We generally recommend the use of noise protection and hearing protection.

DHBV_GB_2.fm

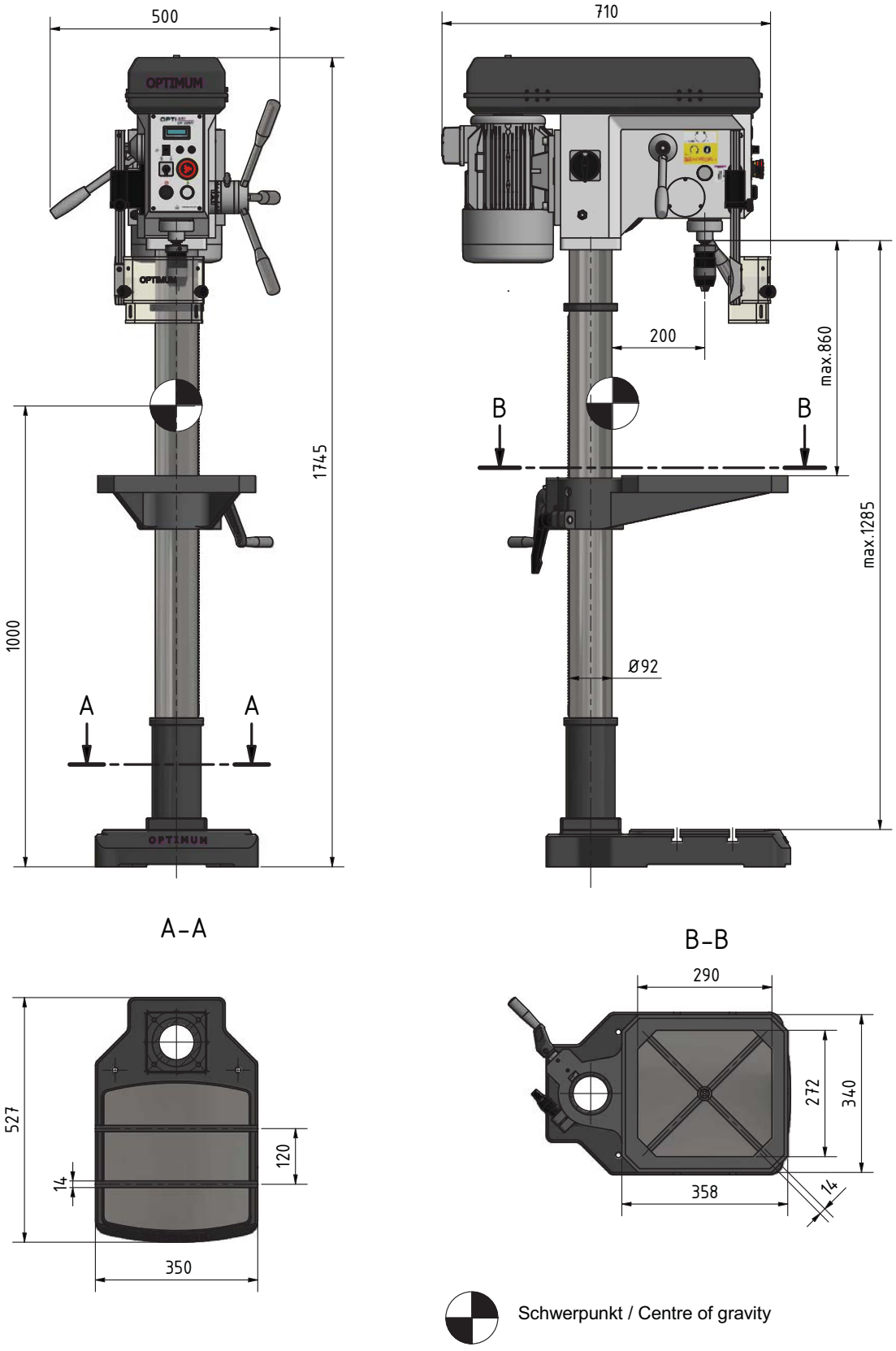
2.16.1 Dimensions DH24BV



DH24BV_GB_2.fm

Img. 2-1: Dimensions DH24BV

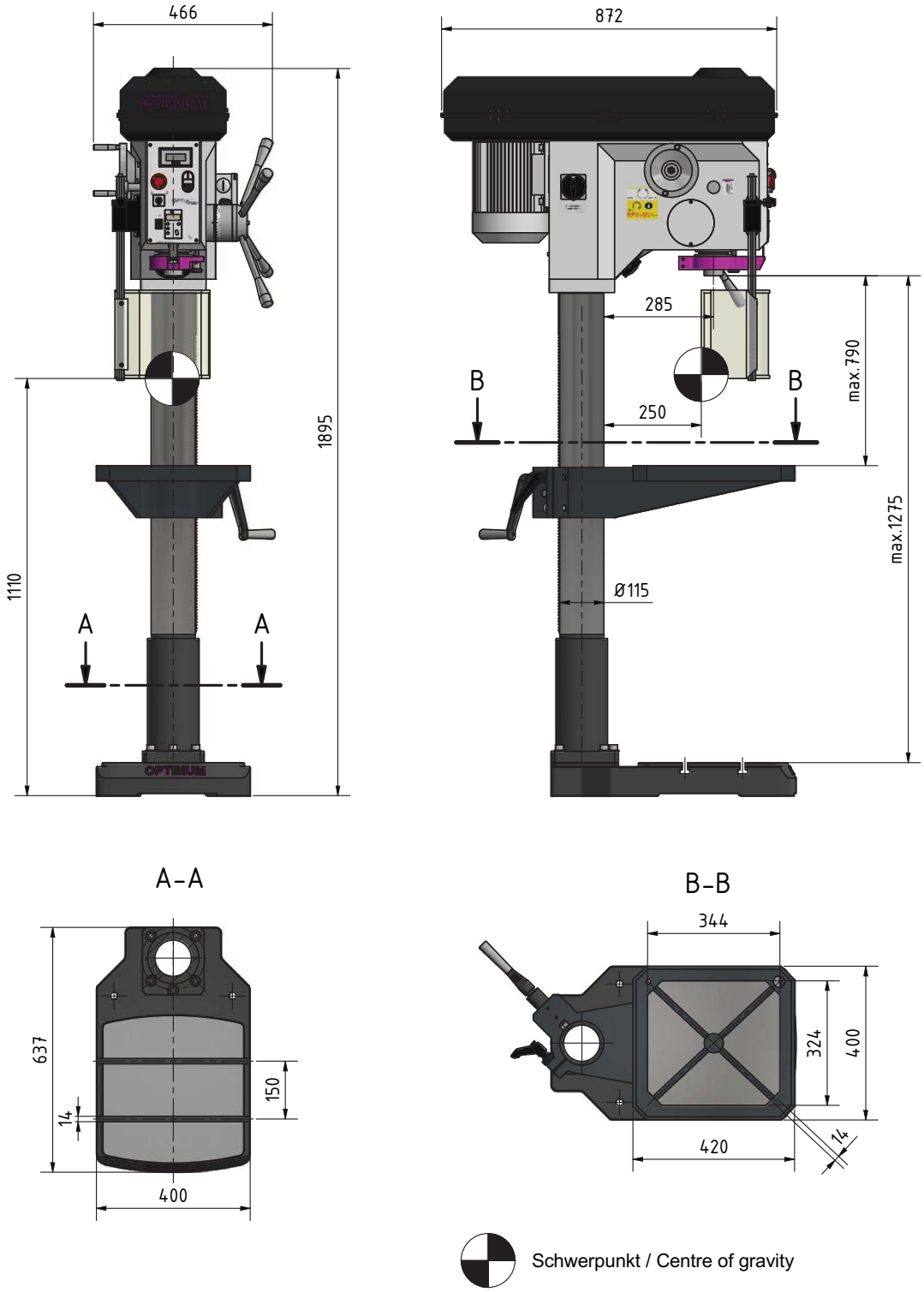
2.16.2 Dimension DH28BV



Img.2-2: Dimension DH28BV

DH28BV_GB_2.fm

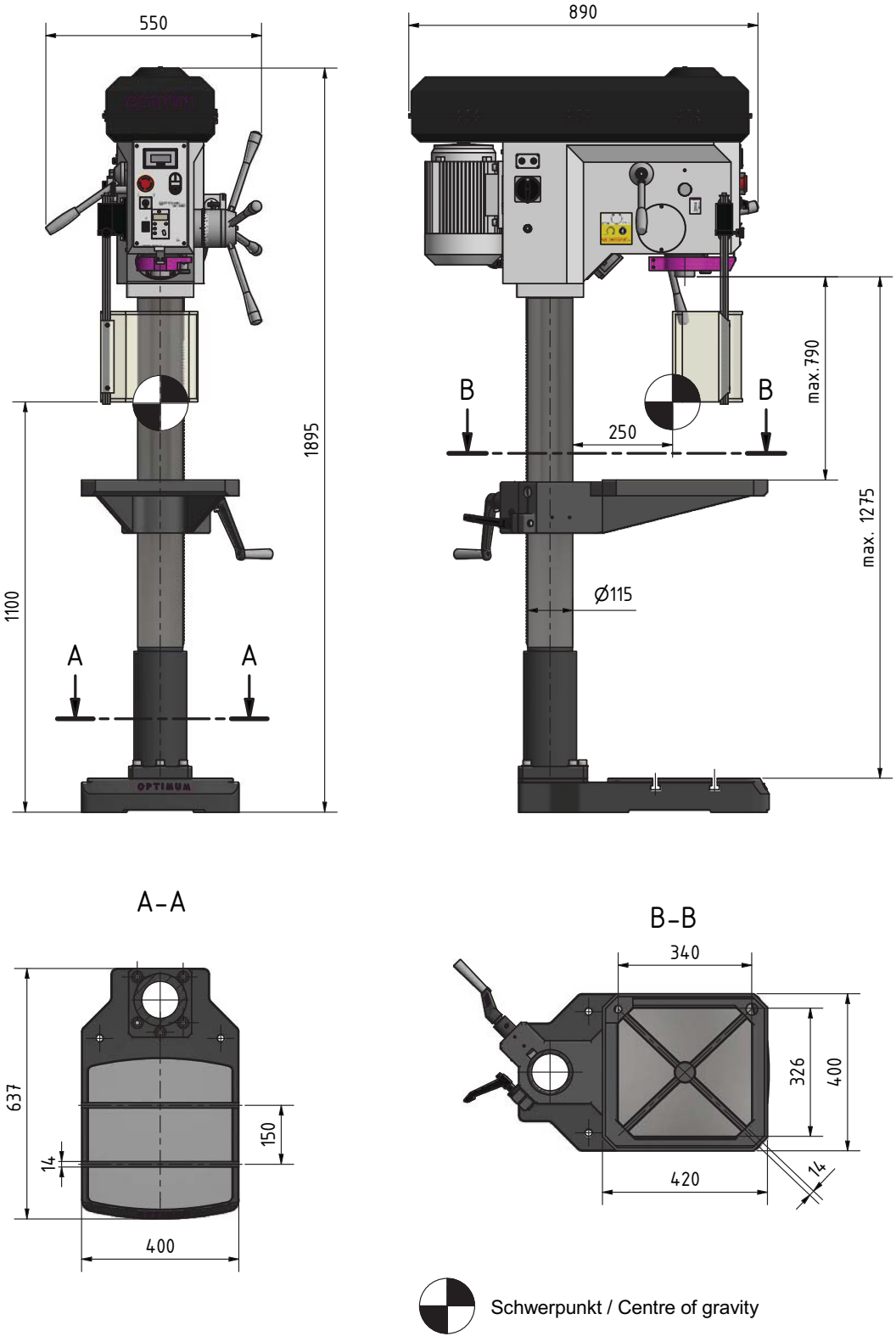
2.17 Dimensions DH34BV



DH34BV_GB_2.fm

Img. 2-3: Dimensions DH34BV

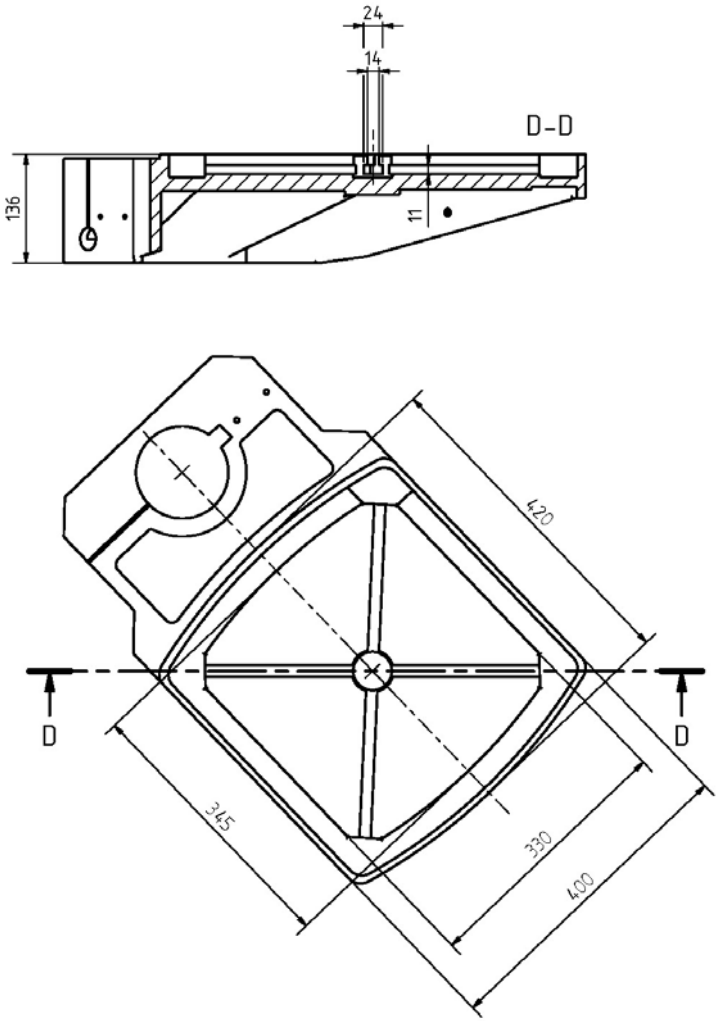
2.18 Dimensions DH40BV



Img.2-4: Dimensions DH40BV

DH40BV_GB_2.fm

2.18.1 Dimensions drilling table DH34BV | DH40BV



Img.2-5: Drilling table

DH40BV_GB_2.fm

3 Delivery, interdepartmental transport, assembly and commissioning

3.1 Notes on transport, installation, commissioning

Improper transport, installation and commissioning is liable to accidents and can cause damage or malfunctions to the machine for which we do not assume any liability or guarantee.

Transport the scope of delivery secured against shifting or tilting with a sufficiently dimensioned industrial truck or a crane to the installation site.

WARNING!

Severe or fatal injuries may occur if parts of the machine tumble or fall down from the forklift truck or from the transport vehicle. Follow the instructions and information on the transport box.

Note the total weight of the machine. The weight of the machine is indicated in the "Technical data" of the machine. When the machine is unpacked, the weight of the machine can also be read on the rating plate.

Only use transport devices and load suspension gear that can hold the total weight of the machine.

WARNING!

The use of unstable lifting and load suspension equipment that might break under load can cause severe injuries or even death. Check that the lifting and load suspension gear has sufficient load-bearing capacity and that it is in perfect condition.

Observe the accident prevention regulations issued by your Employers Liability Insurance Association or other competent supervisory authority, responsible for your company. Fasten the loads properly.

3.1.1 General risks during internal transport

WARNING: TILTING DANGER!

The machine may be lifted unsecured by a maximum of 2 cm.

Employees must be outside the danger zone, i.e. the reach of the load.

Warn employees and advise them of the hazard.

Machines may only be transported by authorized and qualified persons. Act responsibly during transport and always consider the consequences. Refrain from daring and risky actions.

Gradients and descents (e.g. driveways, ramps and the like) are particularly dangerous. If such passages are unavoidable, special caution is required.

Before starting the transport check the transport route for possible danger points, unevenness and faults.

Danger points, unevenness and disturbance points must be inspected before transport. The removal of danger spots, disturbances and unevenness at the time of transport by other employees leads to considerable dangers.

Careful planning of interdepartmental transport is therefore essential.

3.2 Transportation to the installation site

ATTENTION!

The drilling machine is lifted and transported at the drilling head or at the load suspension points of the packaging using a suitable hoisting device.

Make sure that the housing of the pulleys is not getting damaged when suspending the load without packaging. Use squared timber in order to keep the lifting slings away from the housing of the pulleys.

ATTENTION!

Make sure that the load suspension point is balanced (centre of gravity).

➜ Disassemble the fixing screws which are used to fix the machine in the packaging.

➜ Lift the drilling machine carefully from the pallet of the packaging by means of a crane and a forklift truck.

3.3 Installation and assembly

3.3.1 Requirements regarding the installation site

Organize the working area around the drilling machine according to the local safety regulations.

INFORMATION

In order to attain good functionality and a high processing accuracy as well as a long service life of the machine, the place of installation should fulfil certain criteria.

Please observe the following points:

- The device must only be installed and operated in a dry and well-ventilated place.
- Avoid places nearby machines generating chips or dust.
- The installation site must be free from vibrations also at a distance of presses, planing machines, etc.
- The substructure must be suitable for machines. Also make sure that the floor has sufficient load bearing capacity and is level.
- The ground must be prepared in a way that potential coolants cannot penetrate the floor.
- Any parts sticking out such as stops, handles, etc. have to be secured by measures taken by the customer if necessary in order to avoid endangering persons.
- Provide sufficient space for the personnel preparing and operating the machine and transporting the material.
- Also make sure the machine is accessible for setting and maintenance works.
- Provide for sufficient backlight (Minimum value: 500 lux, measured at the tool tip). At lower illumination intensities, additional illumination has to be ensured e.g. by means of a separate workplace lamp.

INFORMATION

The main switch of the drilling-milling machine must be freely accessible.

3.3.2 Assembly

WARNING!

Danger of crushing and overturning.
The drilling machine must be installed by at least 2 people.

3.4 Installation

➜ Check the horizontal orientation of the base of the drilling machine with a spirit level.

➜ Check that the foundation has sufficient floor-load capacity and rigidity. Place the drilling machine on the provided underground.

➜ Fix the drilling machine in the provided through-holes on the machine foot.

WARNING!

The condition of the underground and the fixing type of the machine foot to the underground must be in a way that it can bear the loads of the drilling machine. The underground must be level. Check the horizontal orientation of the base of the drilling machine with a spirit level.

3.5 Fixing

In order to provide for the necessary stability of the drilling machine connect the drilling machine with its foot to the substructure. We recommend you to use shear connector cartridges resp. heavy-duty anchors.

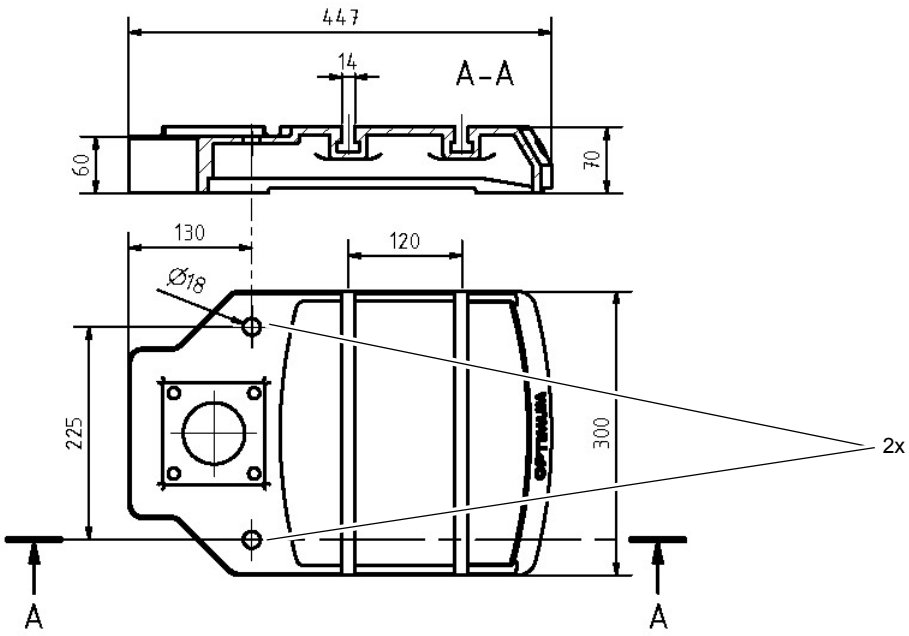
➜ Fix the foot of the geared drill to the substructure with the provided through-holes.

ATTENTION!

Tighten the fixing screws of the drilling machine only as much that it is safely fixed and cannot break away or tilt over.

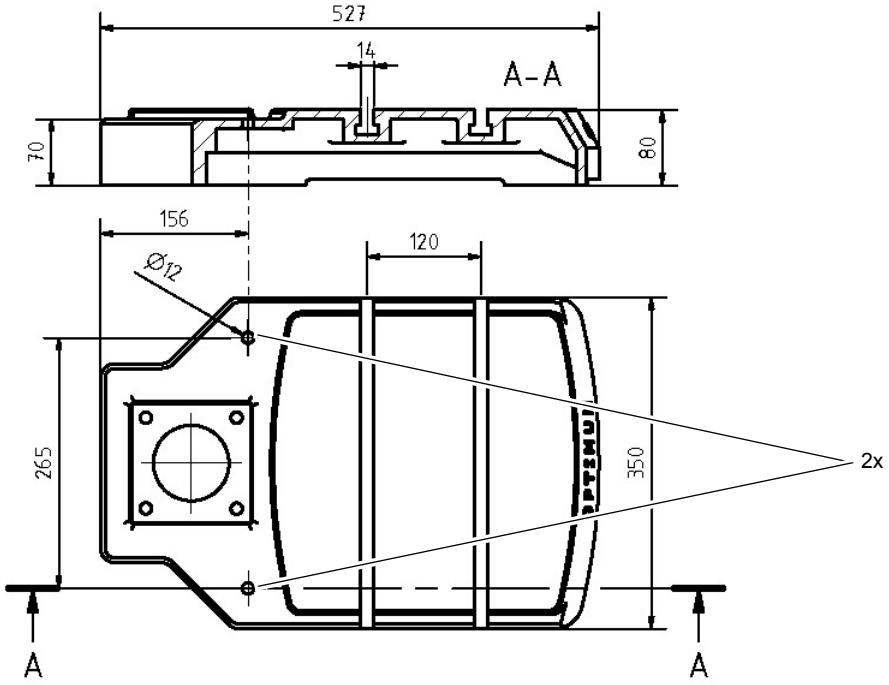
If the fixing screws are too tight in particular in connection with an uneven substructure it may result in a broken stand.

3.6 Fixture DH24BV



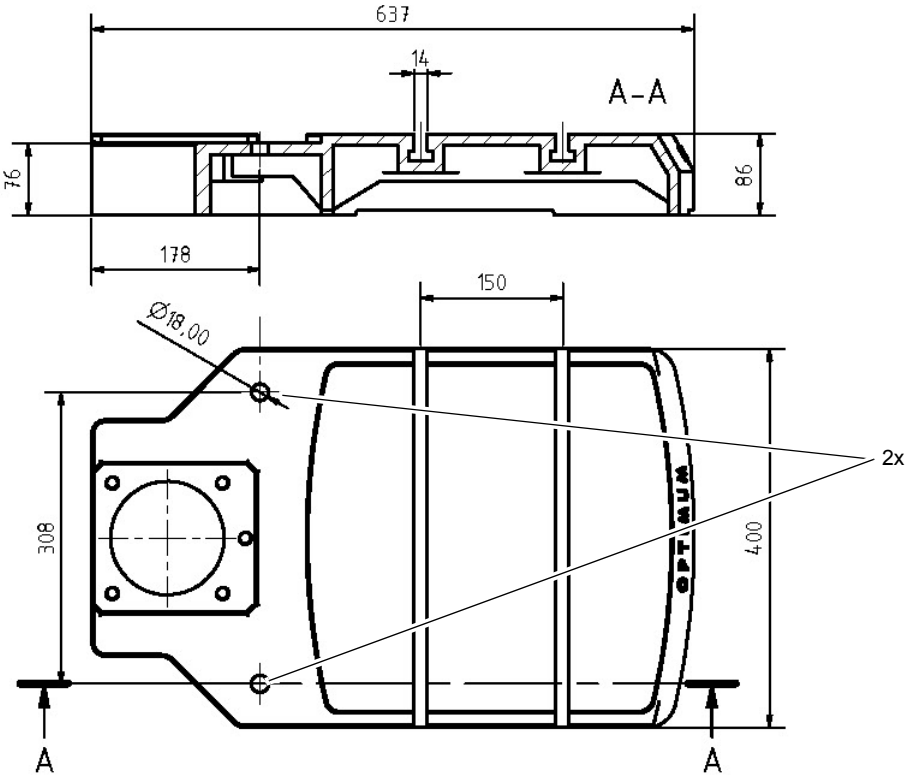
Img. 3-1: Marking of the fixing points on the DH24BV

3.7 Fixture DH28BV



Img. 3-2: Marking of the fixing points on the DH28BV

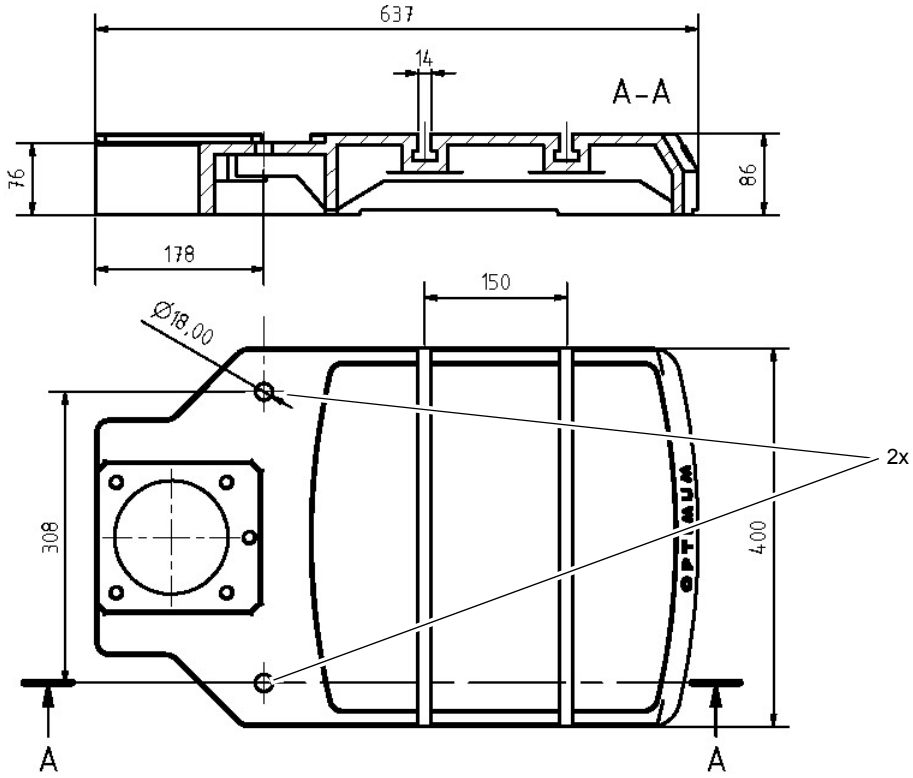
3.8 Fixture DH34BV



Img. 3-3: Marking of the fixing points on the DH34BV

DHBV_GB_3.fm

3.9 Fixture DH40BV



Img. 3-4: Marking of the fixing points on the DH40BV

3.10 First commissioning

ATTENTION!

Before commissioning the machine, check all screws, fixtures and/or safety devices and tighten up the screws if necessary!

WARNING!

Risk by using improper tool holders or operating them at inadmissible speeds.

Only use the tool holders (e.g. drill chuck) which were delivered with the machine or which are offered as optional equipment by OPTIMUM.

Only use tool holders in the intended admissible speed range.

Tool holders may only be modified in compliance with the recommendation of OPTIMUM or of the manufacturer of the clamping devices.

WARNING!

When first commissioning the drilling machine by inexperienced personnel you endanger people, the machine and the equipment.

We do not accept any liability for damages caused by incorrectly performed commissioning.

☞ „Qualification of personnel“ auf Seite 11

3.10.1 Power supply

CAUTION!

Lay the connection cable of the machine so that a stumble of persons is prevented.

➜ Connect the electrical supply cable.

➜ Check the fusing (fuse) of your electrical supply according to the technical instructions regarding the total connected power of the drilling machine.

ATTENTION!

Imperatively make sure that all 3 phases (L1, L2, L3) are correctly connected. Most motor defects result of wrong connections. For instance if a motor phase is not correctly clamped or connected to the neutral conductor (N). Effects may be as follows:

- **The motor is getting hot very rapidly.**
- **Increased motor noises.**
- **The motor has no power.**

ATTENTION!

Make sure that the direction of rotation of the drive motor is correct. The switch position of the rotation selector switch for right-handed rotation (R) has to turn the drill spindle clockwise.

If necessary exchange the two phase connections.

If necessary, exchange two phase connections. The guarantee will become null and void if the machine is connected incorrectly.

3.10.2 Warming up the machine

ATTENTION!

If the drilling machine and in particular the drilling spindle is immediately operated at maximum load when it is cold it may result in damages.

If the machine is cold, e.g. directly after having transported the machine, it should be warmed up at a spindle speed of only 500 1/min for the first 30 minutes.

4 Operation

4.1 Safety

Commission the machine only under the following conditions:

- The machine is in proper working order.
- The machine is used as prescribed.
- The operating manual is followed.
- All safety devices are installed and activated.

All failures should be eliminated immediately. Stop the machine immediately in the event of any anomaly in operation and make sure it cannot be started up accidentally or without authorization

Notify the person responsible immediately of any modification.

☞ Safety during operation on page 16

4.2 Cooling

CAUTION!

Danger of injury due to brushes getting caught or pulled in. Use a spray gun or a washing bottle for cooling.

The friction generated during rotation can cause the edge of the tool to become very hot.

The tool should be cooled during the drilling process. Cooling the tool with a suitable cooling lubricant ensures better working results and a longer edge life of the tools. Use a spray gun or a squeeze bottle for cooling the tool.

INFORMATION

Use a water-soluble and non-pollutant drilling emulsion as a cooling agent.This can be acquired from authorised distributors.

Make sure that the cooling agent is being collected.

Respect the environment when disposing of any lubricants and coolants.

Follow the manufacturer’s disposal instructions.

4.3 Before starting work

Before starting work, select the desired speed. It is depending on the used drilling diameter and on the material.

INFORMATION

The data of the speed tables are guide values. In some cases it may be advantageous to increase or decrease these values.

When drilling a cooling or lubricating agent should be used.

For stainless materials do not center as the material would compact and the drill bit will become rapidly blunt.

The workpieces need to be tensed inflexibly and stably (vice, screw clamp).

WARNING!

For drilling jobs, it is necessary to clamp the workpiece firmly to prevent the bit catching on the pieces. A machine vice or clamping claws is a suitable clamping device.

Put a wooden or plastic board beneath the workpiece to avoid drilling through to the work table, vice, etc.

If required, adjust the desired drilling depth by means of the drilling depth stop in order to obtain a uniform drilling depth.

Please make sure to use a suitable dust suction when treating wood since wood dust may be health hazardous. Wear a suitable dust mask when performing works at which dust is generated.

4.4 During work

The spindle sleeve is advanced by means of the star wheel. Make sure that the feed is constant and not too fast.

The spindle sleeve is returned to its initial position by the return spring.

WARNING!

Seizing of clothes and / or hair.

- **Make sure to wear well-fitting work during drilling work.**
- **Do not use gloves.**
- **If necessary, use a hairnet.**

CAUTION!

Danger of bumps from the levers on the star wheel.

Do not release the star wheel when repositioning the drilling spindle sleeve.

Pull back the drilling spindle sleeve by hand.

CAUTION!

Danger of crushing. Do not place your hand between the drilling head and the spindle sleeve.

INFORMATION

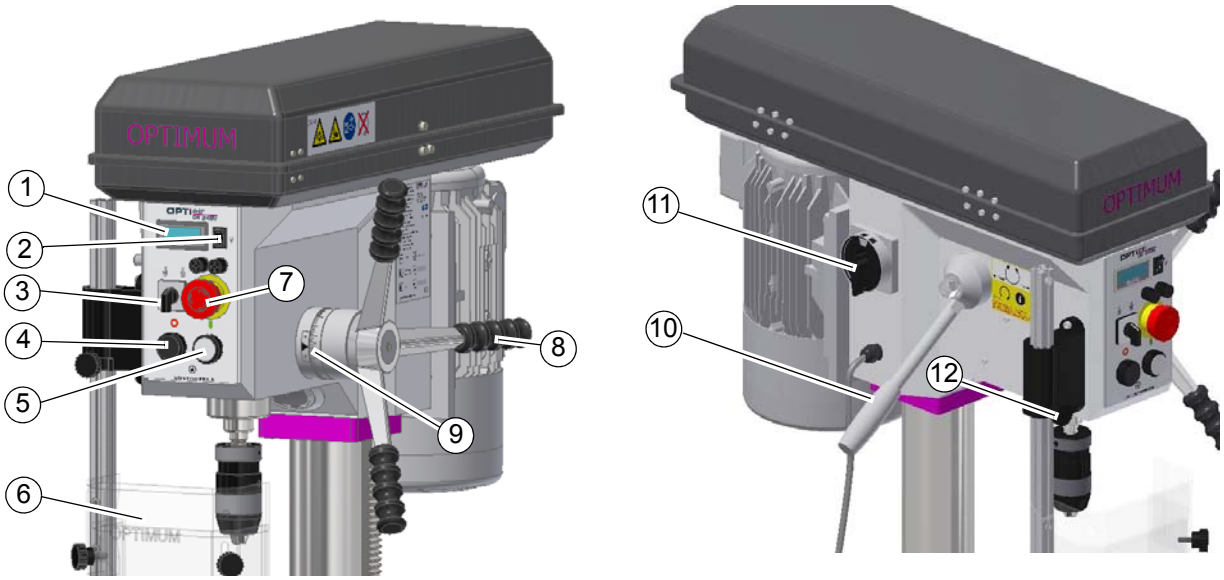
The smaller the bit the more easily it may break.

In the case of deep drilling, remove the bit from time to time to remove filings from the drill. Add a few drops of oil to reduce friction and prolong the service life of the bit.

DHBV_GB_4.fm

4.5 Operation DH24BV

4.5.1 Control and indicating elements



Img.4-1: Control and indicating elements DH24BV

Pos.	Designation	Pos.	Designation
1	Digital display speed	7	EMERGENCY STOP push button
2	Switch machine lamp	8	Spindle sleeve lever
3	Step switch and rotation direction switch	9	Scale drill depth
4	Turn off the push button spindle turn	10	Handwheel speed change
5	Turn on the push button spindle turn	11	Main switch
6	Drill chuck protection	12	Clamping screw height adjustment Drill chuck protection

CAUTION!

Only press the emergency-stop button in a genuine emergency. You should not use the emergency-stop button to stop the machine during normal operation.

4.5.2 Speed change

ATTENTION!

A change of the speed while the drilling spindle is stopped results in damages of the variable speed gear. Only change the speed while the drilling spindle is turning.

The drilling-machine is equipped with a motor with an infinitely variable mechanic gear. The V-belt of the infinitely variable V-belt gear is positioned at the desired V-belt diameter using the handwheel (10) while the drilling spindle is turning. Thus the speed is changed. The lower the spindle speed while adjusting, the more difficult it is to turn the handwheel.

Img.4-2: Control elements DH24BV - speed

4.5.3 Drilling

The following steps are necessary in order to carry out a proper drilling process:

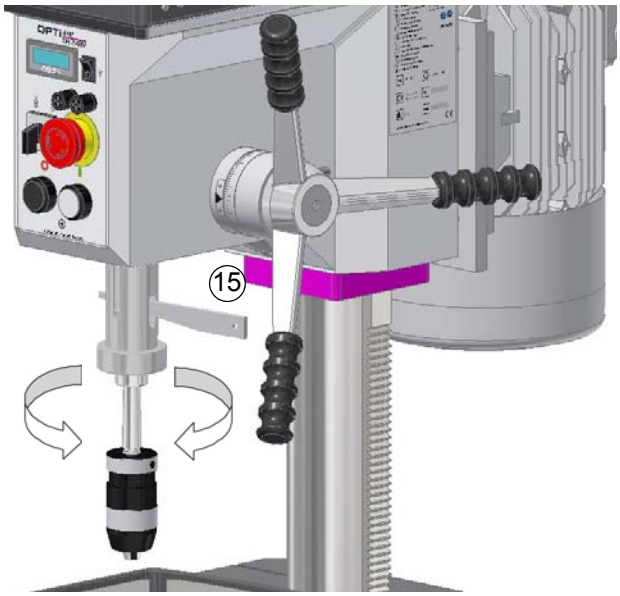
- Select the speed which is suitable for the used drill diameter and for the material which needs to be manufactured. ☞ Determining the cutting speed and the speed on page 47
- Lower the drill by means of the spindle sleeve lever (8) until the drill tip comes into contact with the workpiece.
- Set the scale drilling depth to zero (9).
- Switch on the drill spindle (4) and actuate the spindle sleeve lever for the manual feed (8).

4.5.4 Releasing the tool from the spindle seat

WARNING!

Switch off the drilling machine by pushing the main switch.

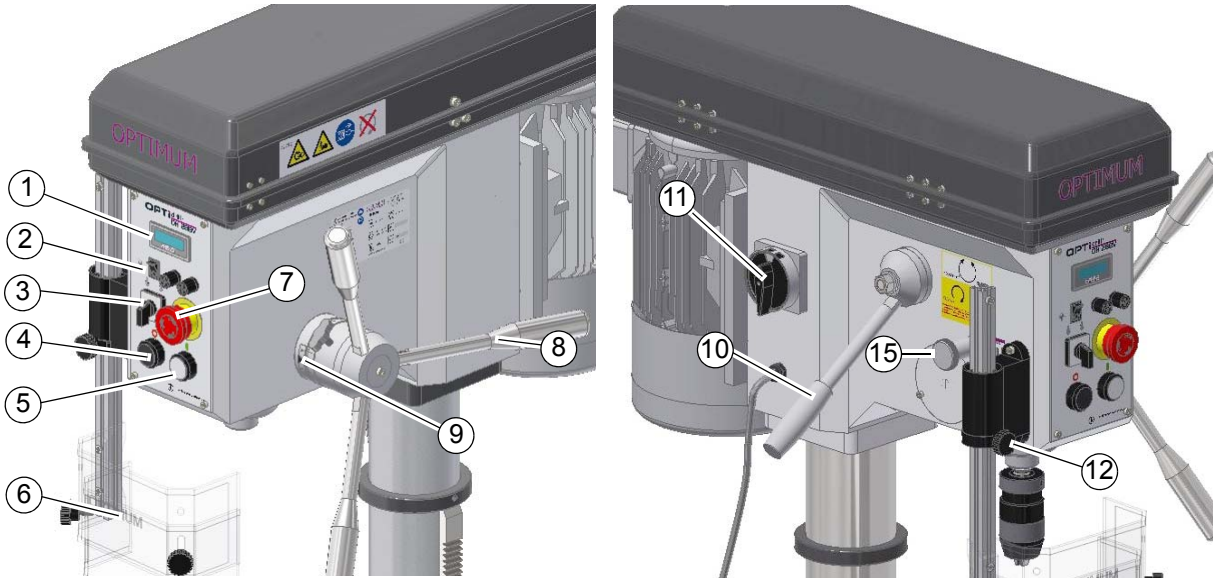
- ➜ Set the main switch to "0".
- ➜ Turn the drilling spindle as far as necessary until the opening of the spindle sleeve and drilling spindle are superposed.
- ➜ Hold the tool with the hand.
- ➜ Release the tool from the drilling spindle using a drill drift (15).
- ➜ Hold the tool with the hand and take it out of the seat.



Img.4-3: Control elements DH24BV -Tool removal

4.6 Operation DH28BV

4.6.1 Control and indicating elements



Img.4-4: Control and indicating elements DH28BV

Pos.	Designation	Pos.	Designation
1	Digital display speed		
2	Switch machine lamp	8	Spindle sleeve lever
3	Step switch and rotation direction switch	9	Scale drill depth
4	Turn off the push button spindle turn	10	Handwheel speed change
5	Turn on the push button spindle turn	11	Main switch
6	Drill chuck protection	12	Clamping screw height adjustment Drill chuck protection
7	EMERGENCY STOP push button	15	Integrated drill drift

CAUTION!

Only press the emergency-stop button in a genuine emergency. You should not use the emergency-stop button to stop the machine during normal operation.

4.6.2 Speed change

ATTENTION!

A change of the speed while the drilling spindle is stopped results in damages of the variable speed gear. Only change the speed while the drilling spindle is turning.

The drilling-machine is equipped with a motor with an infinitely variable mechanic gear. The V-belt of the infinitely variable V-belt gear is positioned at the desired V-belt diameter using the handwheel (10) while the drilling spindle is turning. Thus the speed is changed. The lower the spindle speed while adjusting, the more difficult it is to turn the handwheel.

Img.4-5: Control elements DH28BV - speed

4.6.3 Drilling

The following steps are necessary in order to carry out a proper drilling process:

- Select the speed which is suitable for the used drill diameter and for the material which needs to be manufactured. ☞ Determining the cutting speed and the speed on page 47
- Lower the drill by means of the spindle sleeve lever (8) until the drill tip comes into contact with the workpiece.
- Set the scale drilling depth to zero (9).
- Switch on the drill spindle (4) and actuate the spindle sleeve lever for the manual feed (8).

4.7 Releasing the tool from the spindle seat

4.7.1 With drill drift

WARNING!

Switch off the drilling machine by pushing the main switch.

➜ Set the main switch to "0".
➜ Turn the drilling spindle as far as necessary until the opening of the spindle sleeve and drilling spindle are superposed.
➜ Hold the tool with the hand.
➜ Release the tool from the drilling spindle using a drill drift (16).
➜ Hold the tool with the hand and take it out of the seat.

Img.4-6: Control elements DH28BV -Tool removal

4.7.2 With integrated drill drift

WARNING!

Switch off the drilling machine by pushing the main switch.

ATTENTION!

The tool and/or the drill chuck will fall down. Hold the tool or the drill chuck firmly tight while ejecting it.

ATTENTION!

Do not try to eject the tool in an intermediate position. This may result in a damage of the integrated drill drift.

With the below described procedure the taper mandrel is being loosened from the drilling spindle.

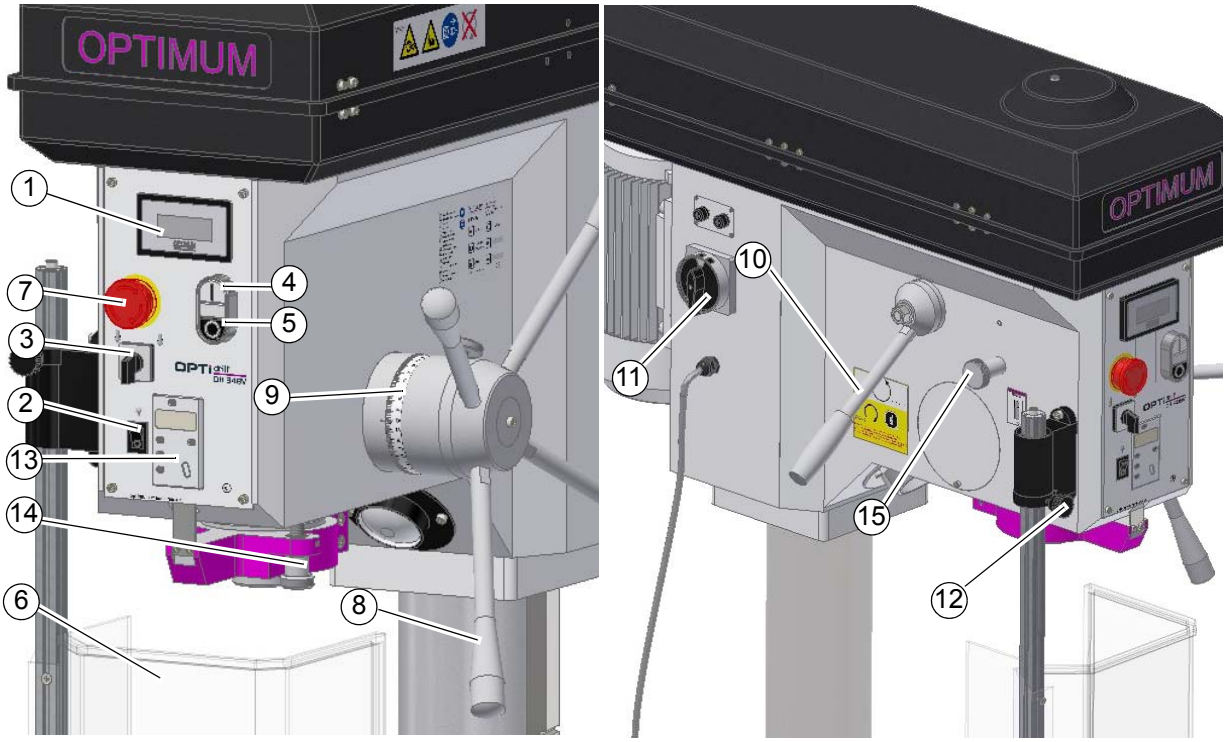
Img.4-7: Disassembly with integrated drill drift

➜ Set the main switch (11) to "0".
➜ Move the spindle sleeve as far downward or upward until the locking bolt (15) can be inserted.
➜ Move the locking bolt (15) as far as necessary until the locking bolt is completely engaged.
➜ Press the spindle sleeve lever with a rapid and powerful movement upwards.
❍ The taper mandrel is pressed out of the drill spindle.

DH28BV_GB_4.fm

4.8 Operation DH34BV | DH40BV

4.8.1 Control and indicating elements



Img.4-8: Control and indicating elements

Pos.	Designation	Pos.	Designation
1	Digital display speed	9	Scale drill depth
2	Switch machine lamp	10	Handwheel speed change
3	Step switch and rotation direction switch	11	Main switch
4	Turn on the push button spindle turn	12	Clamping screw height adjustment Drill chuck protection
5	Turn off the push button spindle turn	13	Digital drilling depth
6	Drill chuck protection	14	Drill depth stop
7	EMERGENCY STOP push button	15	Integrated drill drift
8	Spindle sleeve lever		

CAUTION!

Only press the emergency-stop button in a genuine emergency. You should not use the emergency-stop button to stop the machine during normal operation.

4.9 Speed change

ATTENTION!

A change of the speed while the drilling spindle is stopped results in damages of the variable speed gear. Only change the speed while the drilling spindle is turning.

The drilling-machine is equipped with a motor with an infinitely variable mechanic gear. The V-belt of the infinitely variable V-belt gear is positioned at the desired V-belt diameter using the handwheel (10) while the drilling spindle is turning. Thus the speed is changed. The lower the spindle speed while adjusting, the more difficult it is to turn the handwheel.

Img.4-9: Control elements - speed

4.10 Drilling

The following steps are necessary in order to carry out a proper drilling process:

- Select the speed which is suitable for the used drill diameter and for the material which needs to be manufactured. ☞ Determining the cutting speed and the speed on page 47
- Lower the drill by means of the spindle sleeve lever (8) until the drill tip comes into contact with the workpiece.
- Set the scale drilling depth to zero (9).
- Switch on the drill spindle (4) and actuate the spindle sleeve lever for the manual feed (8).

4.11 Releasing the tool from the spindle seat

4.11.1 With drill drift

WARNING!

Switch off the drilling machine by pushing the main switch.

- ➜ Set the main switch to "0".
- ➜ Turn the drilling spindle as far as necessary until the opening of the spindle sleeve and drilling spindle are superposed.
- ➜ Hold the tool with the hand.
- ➜ Release the tool from the drilling spindle using a drill drift (16).
- ➜ Hold the tool with the hand and take it out of the seat.

Img.4-10: Control elements - tool removal

4.11.2 With integrated drill drift

WARNING!

Switch off the drilling machine by pushing the main switch.

ATTENTION!

The tool and/or the drill chuck will fall down. Hold the tool or the drill chuck firmly tight while ejecting it.

ATTENTION!

Do not try to eject the tool in an intermediate position. This may result in a damage of the integrated drill drift.

With the below described procedure the taper mandrel is being loosened from the drilling spindle.

Img.4-11: Disassembly with integrated drill drift

➜ Set the main switch (11) to "0".

➜ Move the spindle sleeve as far downward or upward until the locking bolt (15) can be inserted.

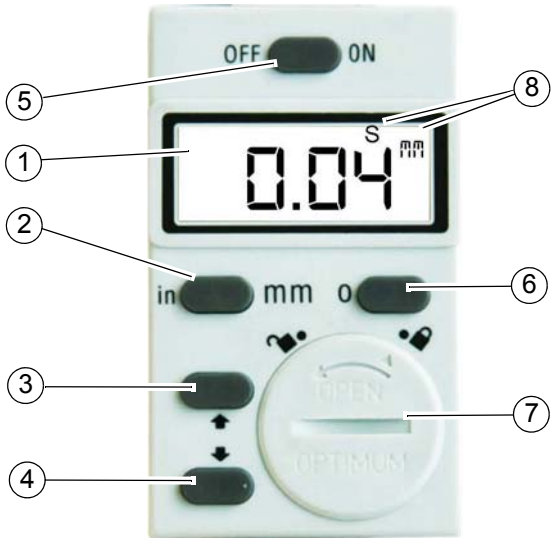
➜ Move the locking bolt (15) as far as necessary until the locking bolt is completely engaged.

➜ Press the spindle sleeve lever with a rapid and powerful movement upwards.

❍ The taper mandrel is pressed out of the drill spindle.

4.12 Digital display for spindle sleeve travel

Measuring range	0 - 999.99mm
	0 - 39.371“inch
Reading precision	0.01mm
	0.0004“inch
Power supply	round cell CR2032 , 3 V 20 x 3,2mm



Pos.	Designation
1	LCD display
2	Shifting mm/inch
3	Performs a value increase in operating mode "S" (Setting)
4	Performs a value decrease in operating mode "S" (Setting)
5	ON/OFF switch
6	Zero position and activation of operation mode "S"
7	Battery bay
8	Display of operation mode "S" and selected unit "mm / inch"

Operation mode "S"

The operation mode "S" is used to enter and to compensate the mechanical play (backlash) of quill mechanism.

- (1) Display which shows the operating modes "S", "inch" or "mm"
- (2) converts the measuring unit from *millimetres* to *inches* and vice versa.
- (3) ▲, Value increase in operation mode "S"
- (4) ▼, Value decrease in operation mode "S"
- (5) Switches the display ON or OFF.
- Resets the display to the set compensation value "S".

Enter the offset value of the quill mechanism

➜ Press the button (6) for about 2-3 seconds. The operation mode (8) "S" is activated and displayed.

➜ Enter the offset value of a quill mechanism, based on your experience with the keys (3) or (4).

➜ Stop the operation mode "S" by pressing the button (6) again.

INFORMATION

Before inserting the new battery, wait about 30 seconds. Please make sure, that the contacts are metallically bright and free from coverings which result from bleeding or gassing batteries. Grip the new batteries only with plastic forceps, if possible not with the hand due to the formation of oxide and never with metal forceps in order to avoid a short circuit. In most cases the round cell will be inserted into the digital display with the marking upside. After inserting the round cell, the battery compartment has to be closed again.

4.12.1 Malfunctions

Malfunction	Cause / possible effects	Solution
Flashing of the display	• Voltage too low	• Change battery
Screen doesn't refresh	• Operation mode "S" is active • Disturbance in the circuit	• Disable the operation mode "S". • Remove the battery, wait 30 seconds and reinsert the battery.
No data visible	• No power supply • Battery voltage less than 3V	• Clean battery contacts • Replace battery

5 Determining the cutting speed and the speed

5.1 Table cutting speeds / infeed

Material table						
Material to be processed	Recommended cutting speed **Vc** in m/min	Recommended infeed **f** in mm/revolution				
		Drill bit diameter **d** in mm				
		2...3	>3...6	>6...12	>12...25	>25...50
Unalloyed construction steels < 700 N/mm²	30 - 35	0.05	0.10	0.15	0.25	0.35
Alloyed construction steels > 700 N/mm²	20 - 25	0.04	0.08	0.10	0.15	0.20
Alloyed steels < 1000 N/mm²	20 - 25	0.04	0.08	0.10	0.15	0.20
Steels, low stability < 800 N/mm²	40	0.05	0.10	0.15	0.25	0.35
Steel, high stability > 800 N/mm²	20	0.04	0.08	0.10	0.15	0.20
non-rust steels > 800 N/mm²	12	0.03	0.06	0.08	0.12	0.18
Cast iron < 250 N/mm²	15 - 25	0.10	0.20	0.30	0.40	0.60
Cast iron > 250 N/mm²	10 - 20	0.05	0.15	0.25	0.35	0.55
CuZn alloy brittle	60 - 100	0.10	0.15	0.30	0.40	0.60
CuZn alloy ductile	35 - 60	0.05	0.10	0.25	0.35	0.55
Aluminum alloy up to 11% Si	30 - 50	0.10	0.20	0.30	0.40	0.60
Thermoplastics	20 - 40	0.05	0.10	0.20	0.30	0.40
Thermosetting materials with organic filling	15 - 35	0.05	0.10	0.20	0.30	0.40
Thermosetting materials with anorganic filling	15 - 25	0.05	0.10	0.20	0.30	0.40

5.2 Speed table

Vc in m/min	4	6	8	10	12	15	18	20	25	30	35	40	50	60	80	100
Drill bit **Ø** in mm	Speed **n** in rpm															
1,0	1274	1911	2548	3185	3822	4777	5732	6369	7962	9554	11146	12739	15924	19108	25478	31847
1,5	849	1274	1699	2123	2548	3185	3822	4246	5308	6369	7431	8493	10616	12739	16985	21231
2,0	637	955	1274	1592	1911	2389	2866	3185	3981	4777	5573	6369	7962	9554	12739	15924
2,5	510	764	1019	1274	1529	1911	2293	2548	3185	3822	4459	5096	6369	7643	10191	12739
3,0	425	637	849	1062	1274	1592	1911	2123	2654	3185	3715	4246	5308	6369	8493	10616
3,5	364	546	728	910	1092	1365	1638	1820	2275	2730	3185	3640	4550	5460	7279	9099
4,0	318	478	637	796	955	1194	1433	1592	1990	2389	2787	3185	3981	4777	6369	7962
Vc in m/min	4	6	8	10	12	15	18	20	25	30	35	40	50	60	80	100

Drilling_VC_GB.fm

Drill bit **Ø** in mm	Speed **n** in rpm															
4,5	283	425	566	708	849	1062	1274	1415	1769	2123	2477	2831	3539	4246	5662	7077
5,0	255	382	510	637	764	955	1146	1274	1592	1911	2229	2548	3185	3822	5096	6369
5,5	232	347	463	579	695	869	1042	1158	1448	1737	2027	2316	2895	3474	4632	5790
6,0	212	318	425	531	637	796	955	1062	1327	1592	1858	2123	2654	3185	4246	5308
6,5	196	294	392	490	588	735	882	980	1225	1470	1715	1960	2450	2940	3920	4900
7,0	182	273	364	455	546	682	819	910	1137	1365	1592	1820	2275	2730	3640	4550
7,5	170	255	340	425	510	637	764	849	1062	1274	1486	1699	2123	2548	3397	4246
8,0	159	239	318	398	478	597	717	796	995	1194	1393	1592	1990	2389	3185	3981
8,5	150	225	300	375	450	562	674	749	937	1124	1311	1499	1873	2248	2997	3747
9,0	142	212	283	354	425	531	637	708	885	1062	1238	1415	1769	2123	2831	3539
9,5	134	201	268	335	402	503	603	670	838	1006	1173	1341	1676	2011	2682	3352
10,0	127	191	255	318	382	478	573	637	796	955	1115	1274	1592	1911	2548	3185
11,0	116	174	232	290	347	434	521	579	724	869	1013	1158	1448	1737	2316	2895
12,0	106	159	212	265	318	398	478	531	663	796	929	1062	1327	1592	2123	2654
13,0	98	147	196	245	294	367	441	490	612	735	857	980	1225	1470	1960	2450
14,0	91	136	182	227	273	341	409	455	569	682	796	910	1137	1365	1820	2275
15,0	85	127	170	212	255	318	382	425	531	637	743	849	1062	1274	1699	2123
16,0	80	119	159	199	239	299	358	398	498	597	697	796	995	1194	1592	1990
17,0	75	112	150	187	225	281	337	375	468	562	656	749	937	1124	1499	1873
18,0	71	106	142	177	212	265	318	354	442	531	619	708	885	1062	1415	1769
19,0	67	101	134	168	201	251	302	335	419	503	587	670	838	1006	1341	1676
20,0	64	96	127	159	191	239	287	318	398	478	557	637	796	955	1274	1592
21,0	61	91	121	152	182	227	273	303	379	455	531	607	758	910	1213	1517
22,0	58	87	116	145	174	217	261	290	362	434	507	579	724	869	1158	1448
23,0	55	83	111	138	166	208	249	277	346	415	485	554	692	831	1108	1385
24,0	53	80	106	133	159	199	239	265	332	398	464	531	663	796	1062	1327
25,0	51	76	102	127	153	191	229	255	318	382	446	510	637	764	1019	1274
26,0	49	73	98	122	147	184	220	245	306	367	429	490	612	735	980	1225
27,0	47	71	94	118	142	177	212	236	295	354	413	472	590	708	944	1180
28,0	45	68	91	114	136	171	205	227	284	341	398	455	569	682	910	1137
29,0	44	66	88	110	132	165	198	220	275	329	384	439	549	659	879	1098
30,0	42	64	85	106	127	159	191	212	265	318	372	425	531	637	849	1062
31,0	41	62	82	103	123	154	185	205	257	308	360	411	514	616	822	1027
32,0	40	60	80	100	119	149	179	199	249	299	348	398	498	597	796	995
33,0	39	58	77	97	116	145	174	193	241	290	338	386	483	579	772	965
34,0	37	56	75	94	112	141	169	187	234	281	328	375	468	562	749	937
35,0	36	55	73	91	109	136	164	182	227	273	318	364	455	546	728	910
36,0	35	53	71	88	106	133	159	177	221	265	310	354	442	531	708	885
37,0	34	52	69	86	103	129	155	172	215	258	301	344	430	516	689	861
38,0	34	50	67	84	101	126	151	168	210	251	293	335	419	503	670	838
Vc in m/min	4	6	8	10	12	15	18	20	25	30	35	40	50	60	80	100

Drilling_Vc_GB.fm

Drill bit Ø in mm	Speed **n** in rpm															
39,0	33	49	65	82	98	122	147	163	204	245	286	327	408	490	653	817
40,0	32	48	64	80	96	119	143	159	199	239	279	318	398	478	637	796
41,0	31	47	62	78	93	117	140	155	194	233	272	311	388	466	621	777
42,0	30	45	61	76	91	114	136	152	190	227	265	303	379	455	607	758
43,0	30	44	59	74	89	111	133	148	185	222	259	296	370	444	593	741
44,0	29	43	58	72	87	109	130	145	181	217	253	290	362	434	579	724
45,0	28	42	57	71	85	106	127	142	177	212	248	283	354	425	566	708
46,0	28	42	55	69	83	104	125	138	173	208	242	277	346	415	554	692
47,0	27	41	54	68	81	102	122	136	169	203	237	271	339	407	542	678
48,0	27	40	53	66	80	100	119	133	166	199	232	265	332	398	531	663
49,0	26	39	52	65	78	97	117	130	162	195	227	260	325	390	520	650
50,0	25	38	51	64	76	96	115	127	159	191	223	255	318	382	510	637

5.3 Examples to calculatory determine the required speed for your drilling machine

The necessary speed is depending on the diameter of the drill bit, on the material which is being machined as well as on the cutting material of the drill bit.

Material which needs to be drilled: St37

Cutting material (drill bit): HSS spiral bit

Set point of the cutting speed [V_c] according to the table: 40 meters per minute

Diameter [d] of your drill bit: 30 mm = 0,03 m [meters]

Selected infeed [f] according to the table: about 0.35 mm/rev

Speed $n = \frac{\vartheta c}{\pi \times d} = \frac{40m}{min \times 3,14 \times 0,03m} = 425(rpm)$

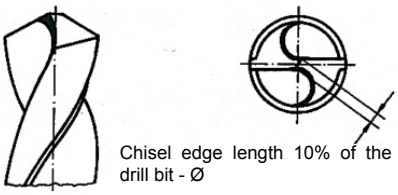
Set a speed on your drilling machine which is less than the determined speed.

INFORMATION

In order to facilitate the production of larger drill holes they need to be pre-drilled. This way, you reduce the cutting forces and improve the guiding of the drill bit.

The pre-drilling diameter is depending on the length of the chisel edge. The chisel edge does not cut, but it squeezes the material. The chisel edge is positioned at an angle of 55° to the major cutting edge.

As a general rule of thumb it applies: The pre-drilling diameter is depending on the length of the chisel edge.



Chisel edge length 10% of the drill bit - Ø

Recommended working steps for a drilling diameter of 30 mm

Example:

1st working step: Pre-drilling with Ø 5 mm.

2nd working step: Pre-drilling with Ø 15 mm.

3rd working step: Drilling with Ø 30 mm.

Drilling_VC_GB.fm

6 Maintenance

In this chapter you will find important information about

- Inspection
- Maintenance
- Repair

The diagram below shows you which tasks belongs to which term.

ATTENTION!

Properly performed regular maintenance is an essential prerequisite for

- **operational safety,**
- **failure-free operation,**
- **long service life of the machine and**
- **the quality of the products which you manufacture.**

Installations and equipment from other manufacturers must also be in good order and condition.

6.1 Safety

WARNING!

The consequences of incorrect maintenance and repair work may include:

- **very serious injury to personnel working on the machine,**
- **damage to the machine.**

Only qualified personnel should carry out maintenance and repair work on the drilling machine.

6.1.1 Preparation

WARNING!

Only carry out work on the machine if it has been unplugged from the mains power supply.

Attach a warning sign which secures against unauthorized switching on.

6.1.2 Restarting

Before restarting, run a safety check.

☞ Safety check on page 14

WARNING!

Before starting the machine you must be sure that

- **no dangers generated for persons,**
- **the machine is not damaged.**

6.2 Inspection and maintenance

The type and level of wear depends to a large extent on the individual usage and operating conditions. Any indicated intervals therefore are only valid for the corresponding approved conditions.

INFORMATION

The spindle bearing is lifetime-lubricated. It is not necessary to lubricate it again.

DHBV_GB_6.fm

6.3 Repair

6.3.1 Customer service technician

For any repair work request the assistance of an authorised customer service technician. Contact your specialist dealer if you do not have customer service's information or contact Stürmer Maschinen GmbH in Germany who can provide you with a specialist dealer's contact information. Optionally, the

Stürmer Maschinen GmbH

Dr.-Robert-Pfleger-Str. 26

D- 96103 Hallstadt

can provide a customer service technician, however, the request for a customer service technician can only be made via your specialist dealer.

If the repairs are carried out by qualified technical personnel, they must follow the indications given in these operating instructions.

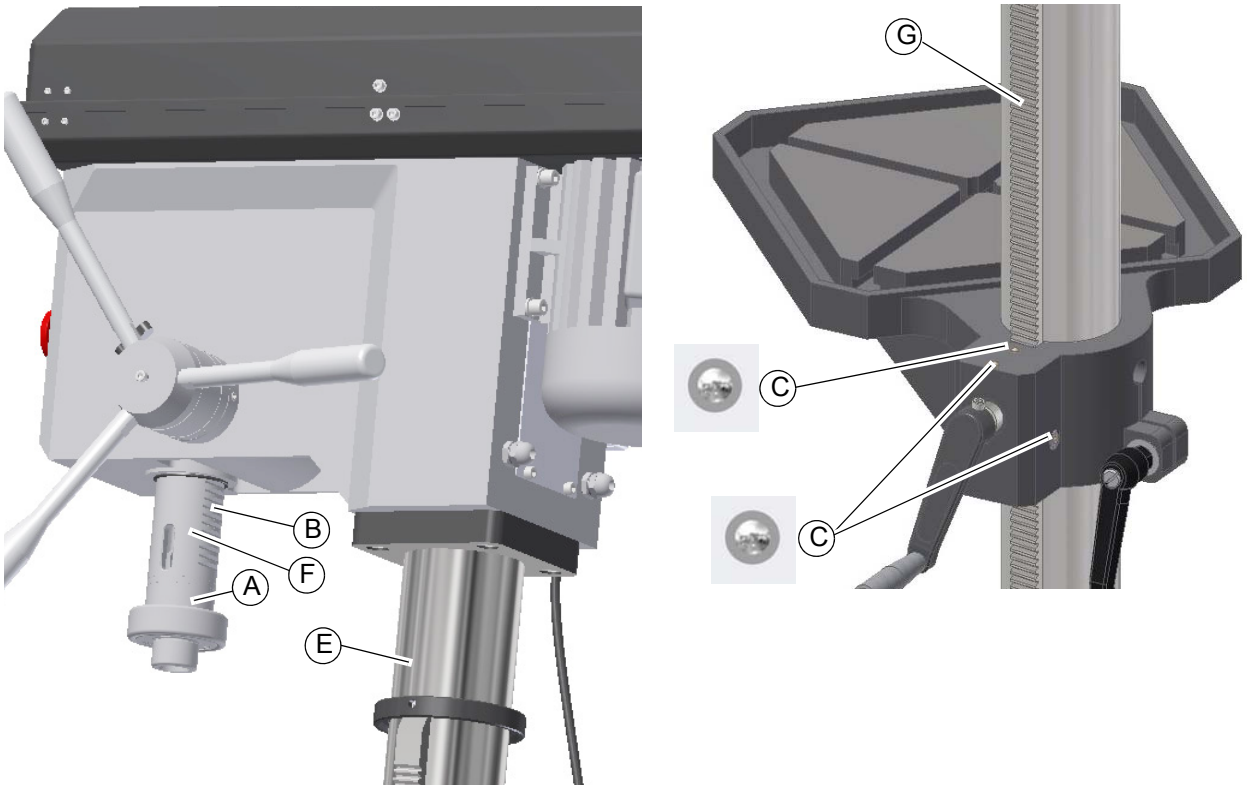
Optimum Maschinen Germany GmbH accepts no liability nor does it guarantee against damage and operating malfunctions resulting from failure to observe these operating instructions.

For repairs only use

- faultless and suitable tools,
- original parts or parts from series expressly authorised by Optimum Maschinen Germany GmbH.

6.4 Inspection and maintenance DH24BV

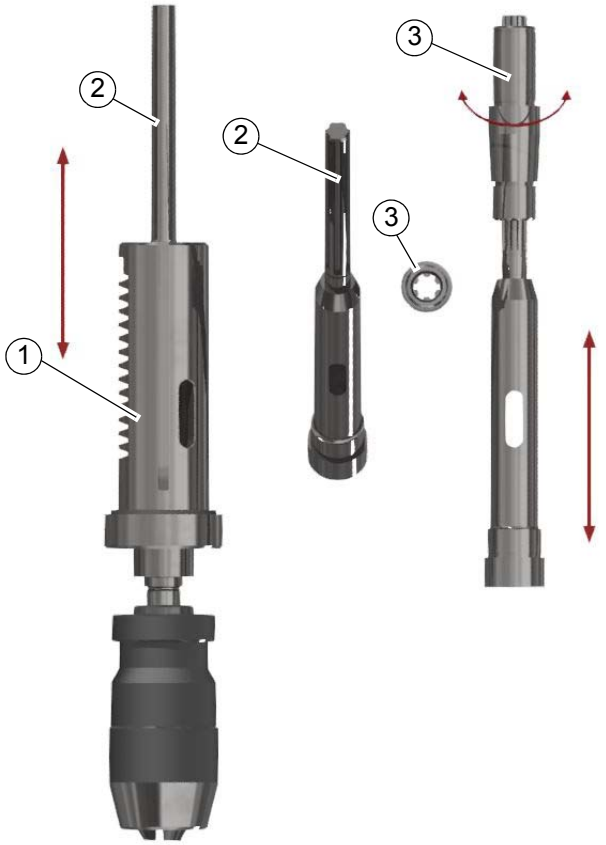
The type and level of wear depends to a large extent on the individual usage and operating conditions. Any indicated intervals therefore are only valid for the corresponding approved conditions.



Img.6-1: Maintenance positions

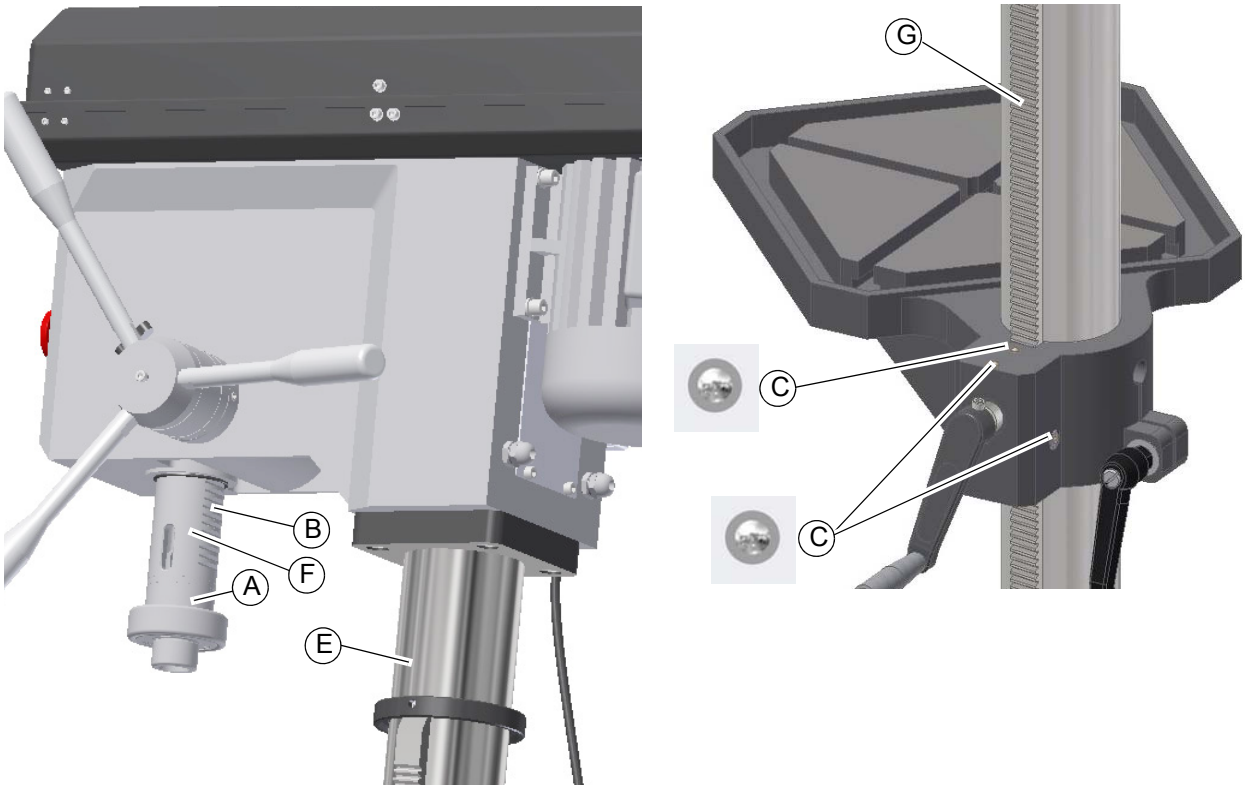
Interval	Where?	What?	
At the beginning of the shift After each maintenance or repair work	**Drilling machine**	Examination for outside damages. ☞ Safety check on page 14	
	A	**Oiling**	➜ Spindle
	B	**Oiling**	➜ Toothing spindle sleeve
	C	**Oiling**	➜ Mounting for table
every 50 hours	**E**	**Oiling**	➜ Column
	F	**Greasing**	➜ Spindle sleeve
	G	**Greasing**	➜ Toothed rod
based on operator's empirical values in accordance with German DGUV (BGV A3)	**Electrical system**	Electrical inspection	☞ Obligations of the operating company on page 12 ☞ Electrical system on page 17

DH24BV_GB_6.fm

Interval	Where?	What?	
in case of need	**Toothing of the spindle**	**Lubrication**	Any unusual rattling noises can be eliminated by **regreasing**. The sleeve (1) moves downwards or upwards with the toothed spindle (2) in the fixed driven sleeve (3) during drill feed. The noises are caused by the necessary clearance between the two toothings of the sleeve and spindle. The grease in the delivery condition may have been used up.  Img.6-2: Regreasing is carried out from above via the spindle drive. Apply grease at the visible toothed area of the spindle. It is recommended to use a grease which can remain permanently inside the toothing. The grease "Staburag NBU 30 PTM" from Klüber is recommended and has proved to be a successful assembly grease for clearance fits.

6.5 Inspection and maintenance DH28BV

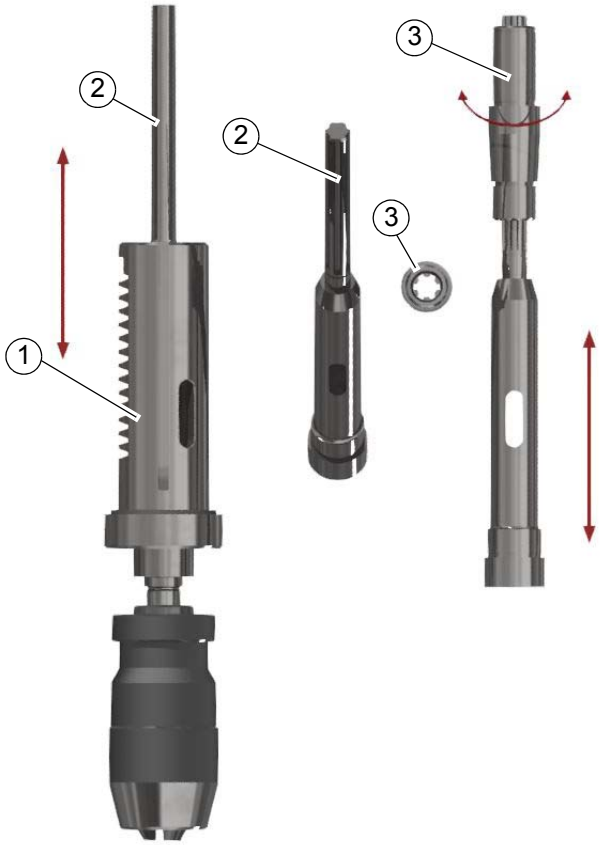
The type and level of wear depends to a large extent on the individual usage and operating conditions. Any indicated intervals therefore are only valid for the corresponding approved conditions.



Img.6-3: Maintenance positions

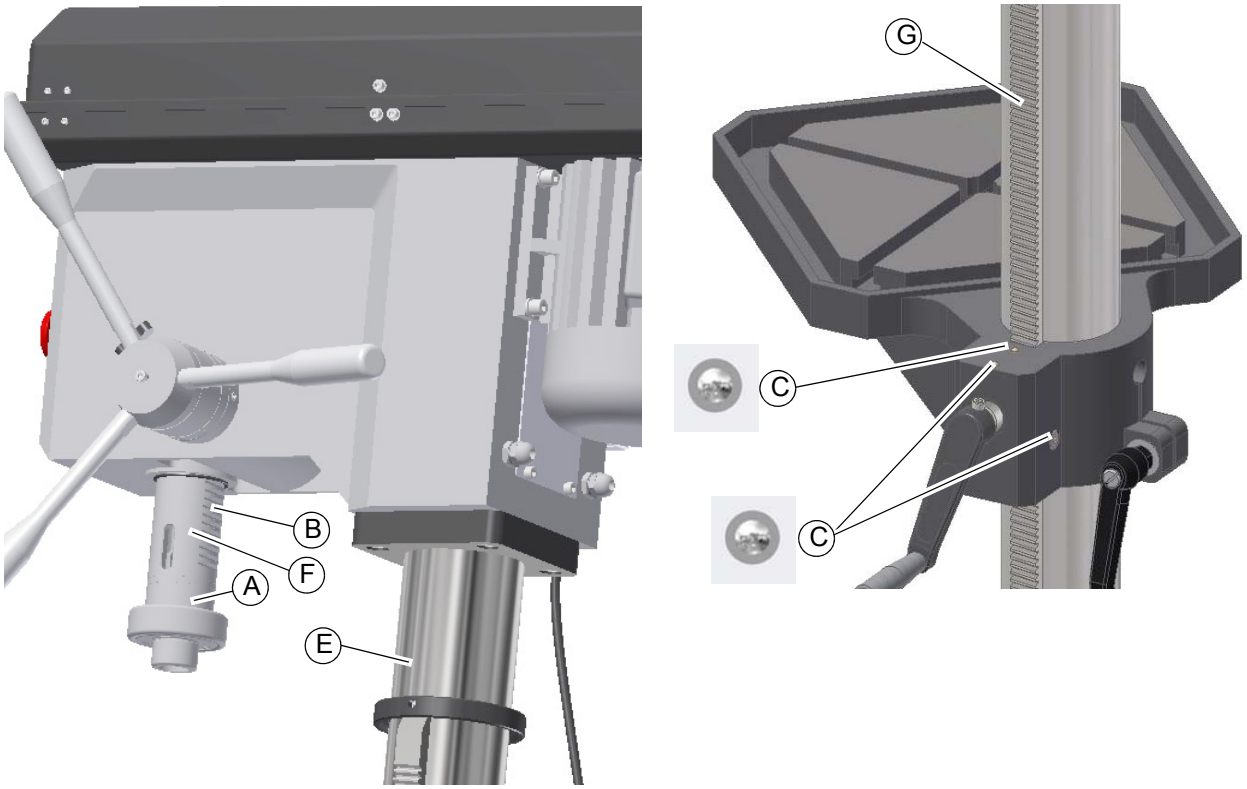
Interval	Where?	What?	
At the beginning of the shift After each maintenance or repair work	**Drilling machine**	Examination for outside damages. ☞ Safety check on page 14	
	A	**Oiling**	➜ Spindle
	B	**Oiling**	➜ Toothing spindle sleeve
	C	**Oiling**	➜ Mounting for table
every 50 hours	**E**	**Oiling**	➜ Column
	F	**Greasing**	➜ Spindle sleeve
	G	**Greasing**	➜ Toothed rod
based on operator's empirical values in accordance with German DGUV (BGV A3)	**Electrical system**	Electrical inspection	☞ Obligations of the operating company on page 12 ☞ Electrical system on page 17

DH28BV_GB_6.fm

Interval	Where?	What?	
in case of need	**Toothing of the spindle**	**Lubrication**	Any unusual rattling noises can be eliminated by **regreasing**. The sleeve (1) moves downwards or upwards with the toothed spindle (2) in the fixed driven sleeve (3) during drill feed. The noises are caused by the necessary clearance between the two toothings of the sleeve and spindle. The grease in the delivery condition may have been used up.  Img.6-4: Regreasing is carried out from above via the spindle drive. Apply grease at the visible toothed area of the spindle. It is recommended to use a grease which can remain permanently inside the toothing. The grease "Staburag NBU 30 PTM" from Klüber is recommended and has proved to be a successful assembly grease for clearance fits.

6.6 Inspection and maintenance DH34BV | DH40BV

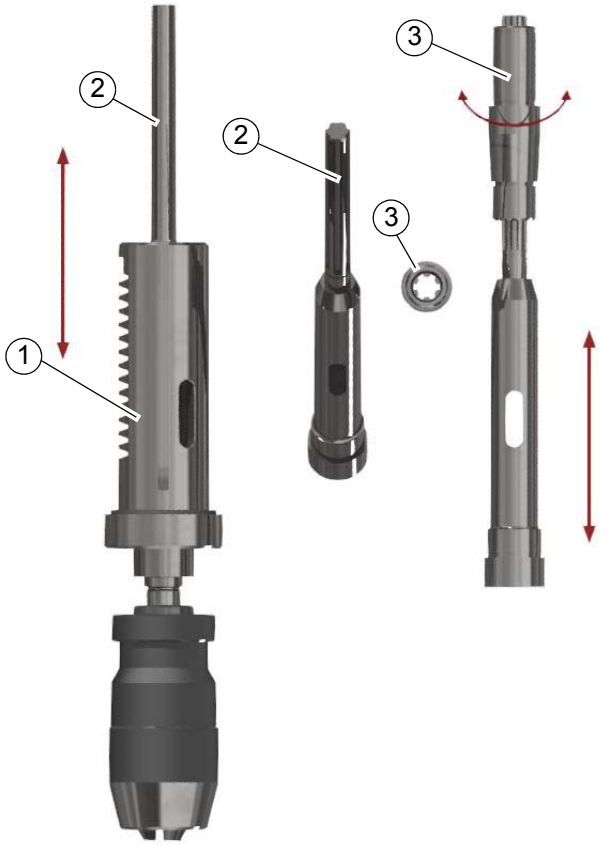
The type and level of wear depends to a large extent on the individual usage and operating conditions. Any indicated intervals therefore are only valid for the corresponding approved conditions.



Img.6-5: Maintenance positions

Interval	Where?	What?	
At the beginning of the shift After each maintenance or repair work	**Drilling machine**	Examination for outside damages. ☞ Safety check on page 14	
	A	**Oiling**	➜ Spindle
	B	**Oiling**	➜ Toothing spindle sleeve
	C	**Oiling**	➜ Mounting for table
	GB	**Oiling**	➜ Drill depth stop
every 50 hours	**E**	**Oiling**	➜ Column
	F	**Greasing**	➜ Spindle sleeve
	G	**Greasing**	➜ Toothed rod
based on operator's empirical values in accordance with German DGUV (BGV A3)	**Electrical system**	Electrical inspection	☞ Obligations of the operating company on page 12 ☞ Electrical system on page 17

DH34BV_DH40BV_GB_6.fm

Interval	Where?	What?	
in case of need	**Toothing of the spindle**	**Lubrication**	Any unusual rattling noises can be eliminated by **regreasing**. The sleeve (1) moves downwards or upwards with the toothed spindle (2) in the fixed driven sleeve (3) during drill feed. The noises are caused by the necessary clearance between the two toothings of the sleeve and spindle. The grease in the delivery condition may have been used up.  Img.6-6: Regreasing is carried out from above via the spindle drive. Apply grease at the visible toothed area of the spindle. It is recommended to use a grease which can remain permanently inside the toothing. The grease "Staburag NBU 30 PTM" from Klüber is recommended and has proved to be a successful assembly grease for clearance fits.

7 Ersatzteile - Spare parts

7.1 Ersatzteilbestellung - *Ordering spare parts*

Bitte geben Sie folgendes an - *Please indicate the following :*

- Seriennummer - *Serial No.*
- Maschinenbezeichnung - *Machines name*
- Herstellungsdatum - *Date of manufacture*
- Artikelnummer - *Article no.*

Die Artikelnummer befindet sich in der Ersatzteilliste. *The article no. is located in the spare parts list.* Die Seriennummer befindet sich am Typschild. *The serial no. is on the rating plate.*

7.2 Hotline Ersatzteile - Spare parts Hotline

+49 (0) 951-96555 -118

ersatzteile@stuermer-maschinen.de

7.3 Service Hotline

+49 (0) 951-96555 -100

service@stuermer-maschinen.de

7.4 DH24BV - Bohrkopf - Drilling head

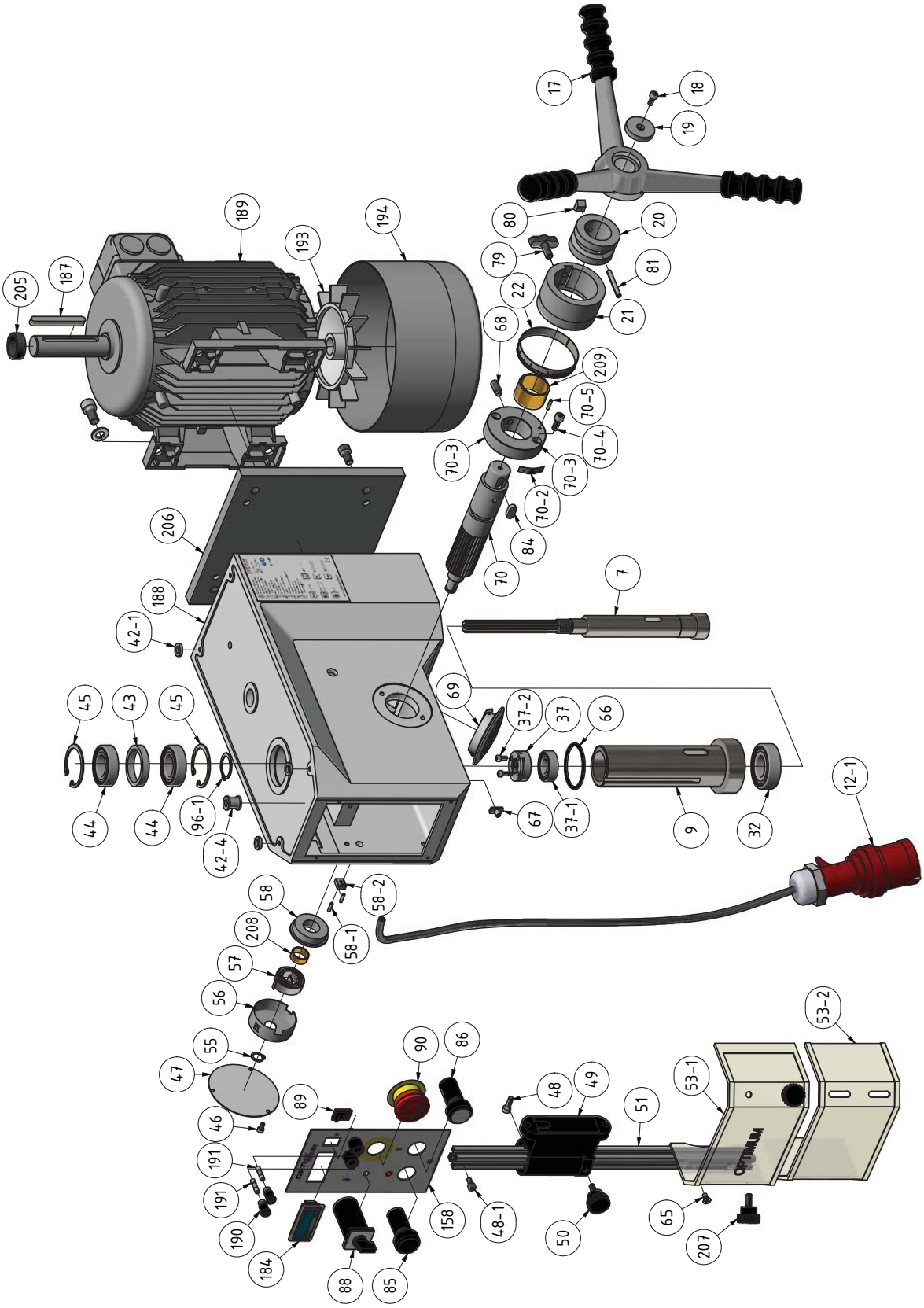
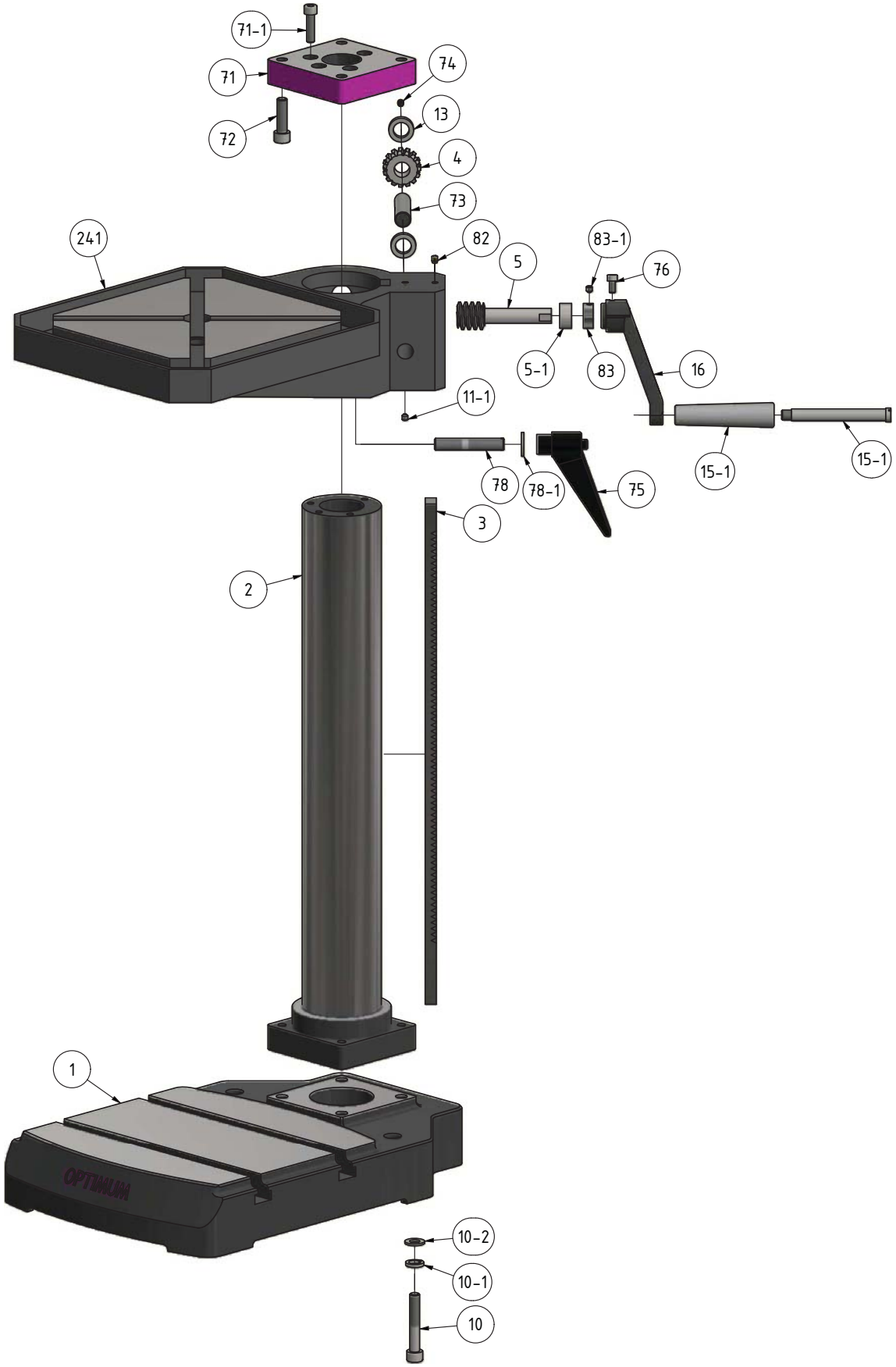


Abb. 7-1: Bohrkopf DH24BV - Drilling head DH24BV

DH24BV_parts.fm

7.5 DH24BV - Säule und Bohrtisch - Column and drilling table



DH24BV_parts.fm

Abb. 7-2: Säule und Bohrtisch DH24BV - Column and drilling table DH24BV

7.6 DH24BV - Antrieb - Drive - Version 1.0

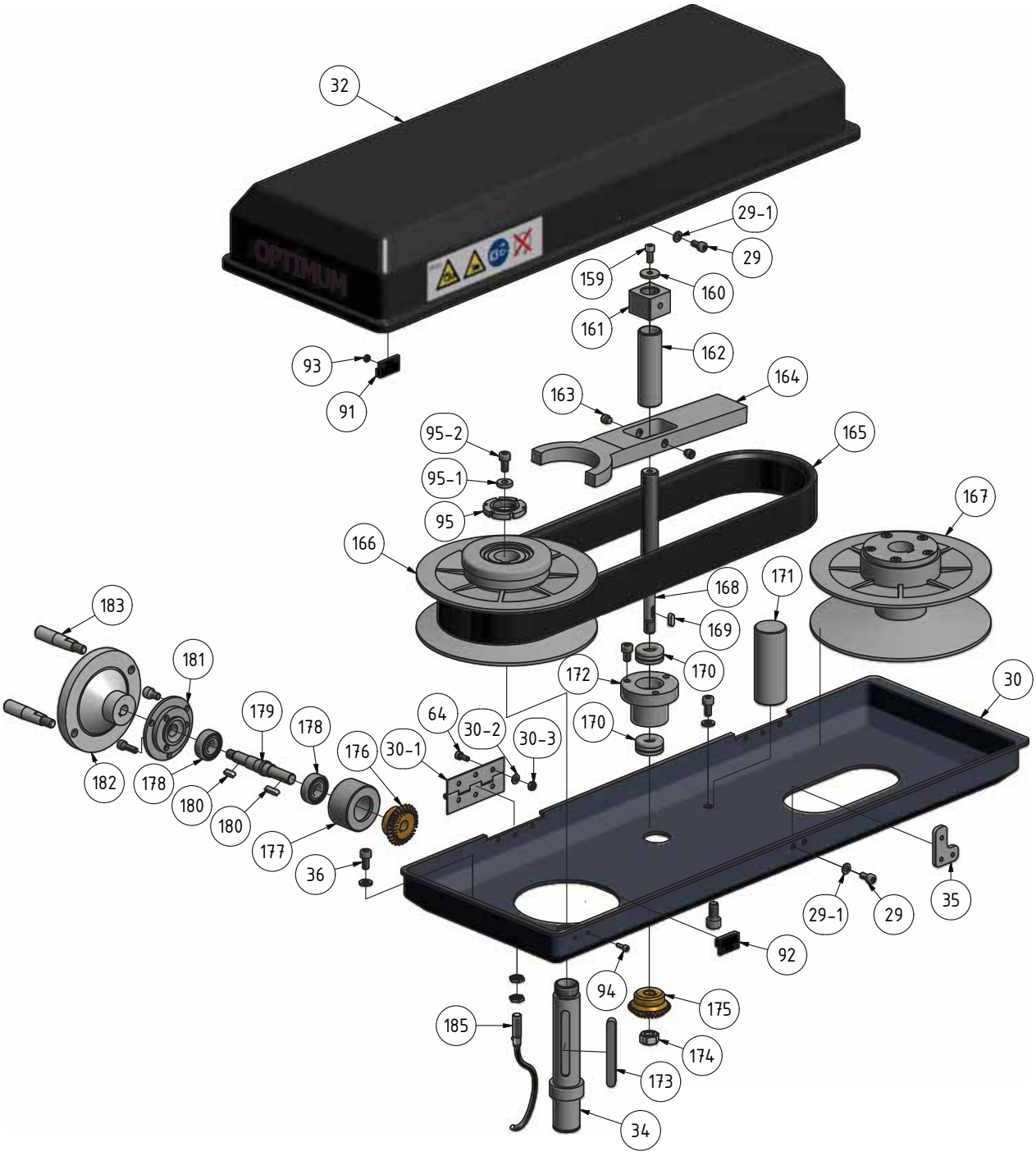


Abb. 7-3: Antrieb DH24BV - Drive DH24BV

DH24BV_ parts.fm

7.7 DH24BV - Antrieb - Drive - Version 1.1

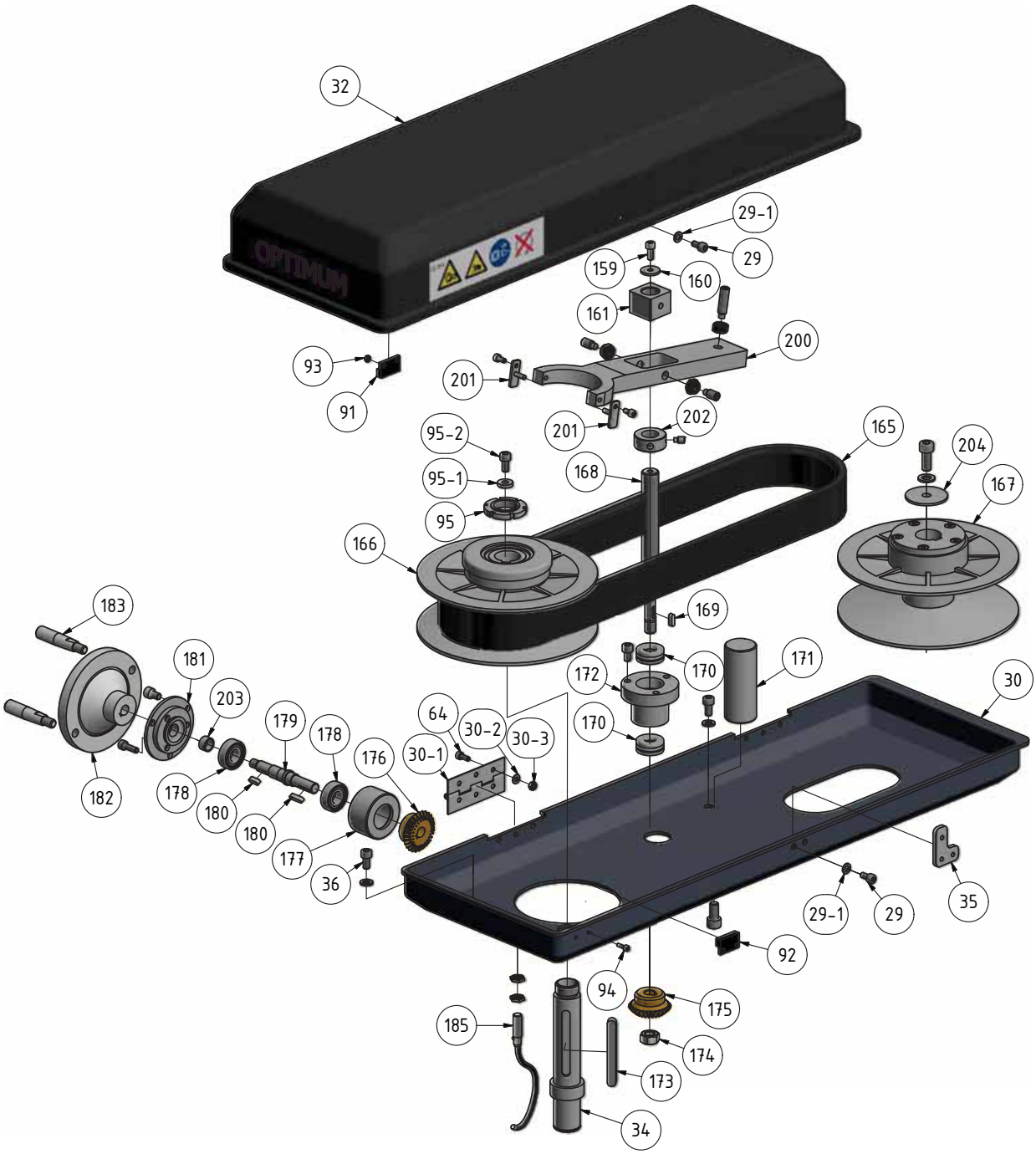


Abb. 7-4: Antrieb DH24BV - Drive DH24BV

DH24BV_parts.fm

7.8 DH24BV - Antrieb - Drive - Version 1.2

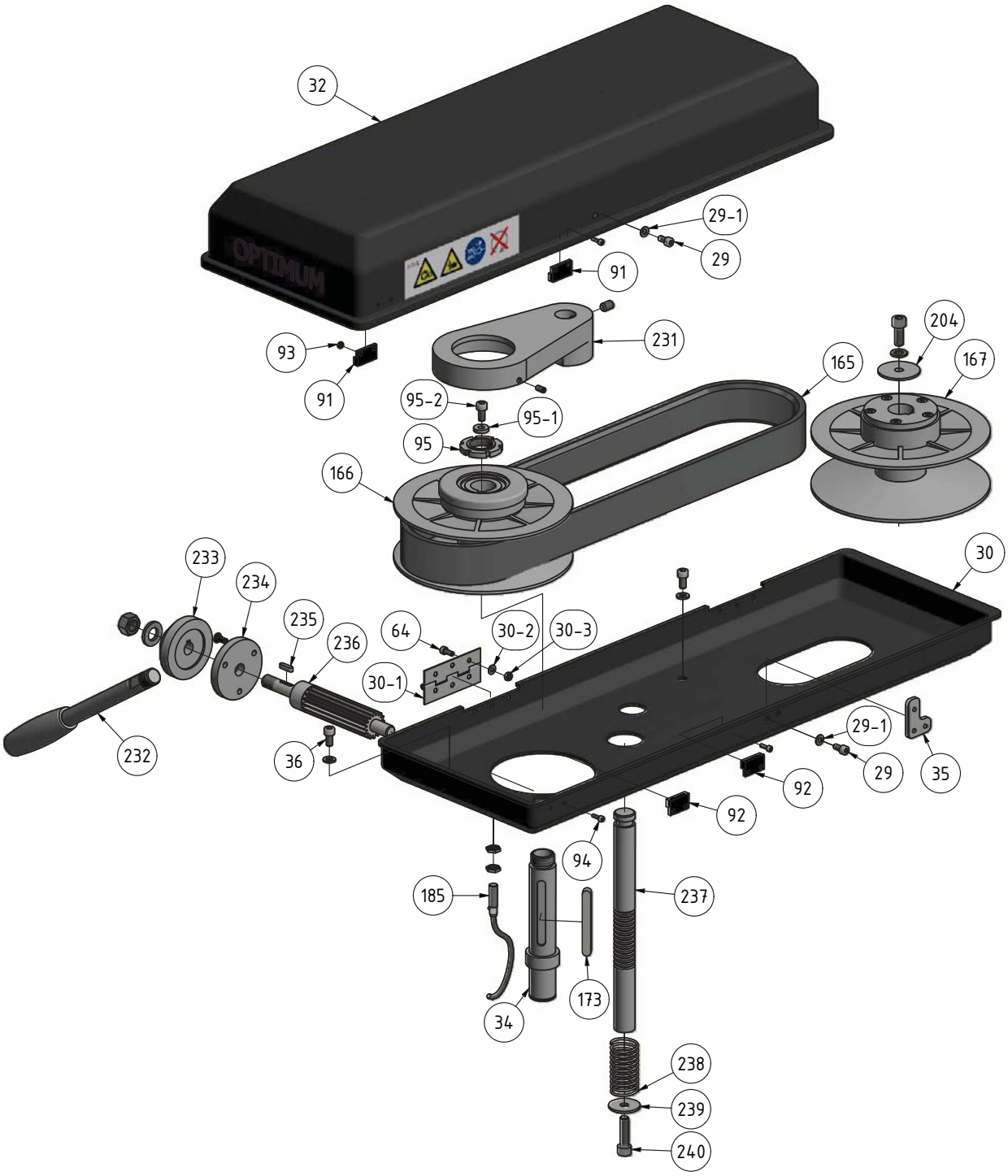


Abb. 7-5: Antrieb DH24BV - Drive DH24BV

DH24BV_ parts.fm

7.9 DH24BV - Maschinenschilder - Machine labels

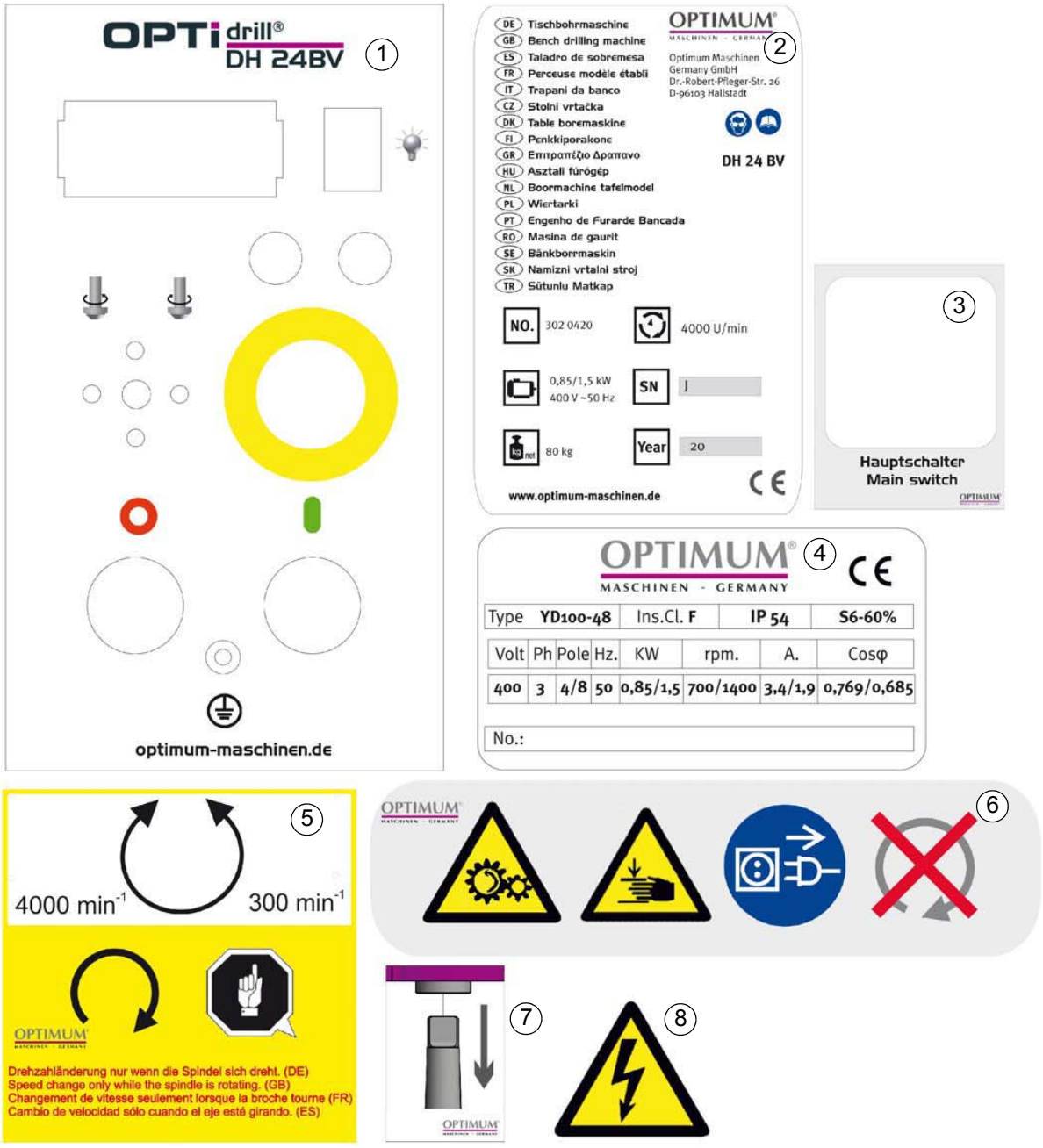


Abb.7-6: Maschinenschilder - Machine labels

DH24BV_parts.fm

7.9.1 DH24BV - Ersatzteilliste - Spare parts list

DH24BV						
Pos.	Bezeichnung	Designation	Menge		Grösse	Artikelnummer
			Qty.	Abb.	Size	Item no.
1	Standfuss	Base	1	1.2		030202411
2	Bohrsäule	Column	1	1.2		030202412
3	Zahnstange	Toothed rack	1	1.2		030202413
4	Zahnrad	Toothed wheel	1	1.2		030202414
5	Antriebsschnecke	Drive screw	1	1.2		030202415
5-1	Distanzscheibe	Spacer	1			
7	Spindel	Spindle	1	1.1		030202417
8	Flachriemen	Flat belt	1	o. Abb.		030202418
9	Pinole	Spindle sleeve	1	1.1		030202419
CPL	Pinole komplett	Sleeve complete	1	1.1		030202419CPL
10	Innensechskantschraube	Socket head screw	4		M10x60	
10-1	Scheibe	Washer	4		GB/T93-1987-10	
10-2	Scheibe	Washer	4		GB/T97.1-1985-10	
11-1	Innensechskant - Stiftschraube	Threaded pin	1		M6x6	
12	Kugellager	Ball bearing	1	o. Abb.	6205	0406205R
12-1	Stecker- Netzanschluss 400 V	Connector electric supply 400V	1			
13	Distanzhülse	Spacer	2	1.2		0302024113
14	Schraube	Screw	1	1.2	JB-T7270.4-1994-2	03020219139
15-1	Griff komplett	Handle complete	1		JB-T7270.4-1994	
16	Handkurbel	Crank	1	1.2		0302024116
17	Pinolenvorschubgriff	Spindle sleeve feed grip	1	1.1		0302024117
18	Innensechskantschraube	Socket head screw	1		M5x25	
19	Scheibe	Plate	1	1.1		0302024119
20	Buchse Skala	Bushing scale	1	1.1		0302024120
21	Skalenring	Scale ring	1	1.1		0302024121
22	Skala	Scale	1	1.1		0302024122
29	Innensechskantschraube	Socket head screw	3		M5x10	
29-1	Scheibe	Washer	3		5	
30	Riemengehäuse Unterteil	Belt housing bottom part	1	1.3		0302024132U
30-1	Scharnier	Articulation	2			
30-2	Scheibe	Washer	12		4	
30-3	Sechskantmutter	Hexagonal nut	12		M4	
31-1	Innensechskant - Stiftschraube	Threaded pin	1			
32	Riemengehäuse Oberteil	Belt housing upper part	1	1.3		0302024132D
35	Platte Schließer	Plate closer	1	1.3		0302024135
36	Innensechskantschraube	Socket head screw	4		M6x12	
37	Spindelmutter	Spindle nut	1	1.1		0302024137
37-1	Kugellager	Ball bearing	1	1.1	6003-2Z	0406003ZZ
37-2	Innensechskantschraube	Socket head screw	2		M4x8	
41	Motorplatte	Engine plate	1	o. Abb.		0302024141

42-1	Scheibe	Washer	4			
42-4	Buchse	Bushing	1			
43	Distanzring	Spacer ring	1			
44	Kugellager	Ball bearing	2	1.1	6005	0406005R
45	Sicherungsring	Circlip	2	1.1	DIN472 47x1.6	042SR47W
46	Innensechskantschraube	Socket head screw	3		M4x10	
47	Abdeckplatte	Covering plate	1			
48	Innensechskantschraube	Socket head screw	2		M6x30	
48-1	Innensechskantschraube	Socket head screw	1			
49	Halterung Bohrfutterschutz	Fixing drill chuck proetection	1	1.1		0302024149CPL
50	Griffschraube	Knurled screw	1	1.1	M6x30	03020241535
51	Arm Bohrfutterschutz	Arm drill chuck protection	1		20x20	
53	Sichtschutzscheibe Bohrfutterschutz	View sealing pane drill chuck protection	1	1.1		0302024153
55	Sicherungsring	circlip	1	1.1	DIN471-12x1	042SR12W
57	Spiralfeder inkl. Gehäuse	Spiral spring incl. Housing	1	1.1		0302024157
58	Buchse verzahnte Welle	Bushing toothed shaft	1	1.1		0302024158
58-1	Spannstift	Split pin	2	1.1	3x12	03020241581
58-2	Spanner Spiralfeder	Spanner spiral spring	1	1.1		03020241582
62	Innensechskantschraube	Socket head screw	4		M4x8	
63	Lichtschalter	Machine lightning switch	1		250V 6A	
64	Innensechskantschraube	Socket head screw	12		M4x10	
65	Innensechskantschraube	Socket head screw	2		M6x20	
66	O-Ring	O-ring	1	1.1		0302024166
67	Nutenstein	sliding block	1	1.1		0302024167
68	Gewindestift	Setscrew	1		M8x15	
69	Deckel Beleuchtung	Cover illumination	1	1.1		0302024169
69-1	Glühlampe (Diode)	Lamp (diode)	1	o. Abb.	12V / 20W	046423800
70	Schaftrizel mit Nabe	Shank pinion	1	1.1		0302024170
70-2	Anzeige Skala	Mechanicel indicator scale	1	1.1		03020241702
70-3	Ring	Ring	1	1.1		03020241703
70-4	Innensechskantschraube	Socket head screw	2		M6x16	
70-5	Spannstift	Spring pin	1			
71	Platte	Plate	1	1.2	M8x30	0302024171
71-1	Innensechskantschraube	Socket head screw	4			
72	Innensechskantschraube	Socket head screw	4		M10x25	
73	Welle	Shaft	1	1.2		0302024173
74	Oeler	Oiler	4	1.2		0340105
75	Klemmhebel	Clamping lever	1	1.2		0302024175
76	Innensechskantschraube	Socket head screw	1		M6x20	
77	Innensechskantschraube	Socket head screw	1		M12x60	
78	Klemmschraube	Clamping screw	1	1.2	M12x60	0302024178
78-1	Scheibe	Washer	1		12	
79	Griffschraube	Knurled screw	1	1.2	M8x20	0302024179
80	Nutenstein	Sliding block	1	1.1		0302024180
81	Zylinderstift	Straight pin	1		6x40	
82	Öler	Pressure Oil Cup	2			

83	Distanzhülse	Spacer	1	1.2		0302024183
83-1	Innensechskant - Stiftschraube	Threaded pin	1		M6x6	
84	Paßfeder	Key	1	1.1	8x8x18	042P8820
85	Drucktaster Ein	Bush button On	1	1.1	230V 5A	0302024185
85-1	Betriebskontrolleuchte	Operating control light	1	1.1	24V	046690349
86	Drucktaster Aus	Bush button Off	1	1.1	230V 5A	0302024186
88	Schalter Drehrichtung	Switch for direction of rotation	1	1.1	250V 24V/12A 50Hz	0460009
89	Schalter Licht	Light switch	1	1.1	250V 6A	0460005
90	Schalter NOT-Halt	Emergency- stop switch	1	1.1	600V 10A	0460058
91	Gegenstück Reedkontakt	Counterpart reed contact	2			
92	Reed Kontakt	Reed contact	2	1.3	PS-3150	0302024192
93	Sechskantmutter	Nut	4		M4	
94	Innensechskantschraube	Socket head screw	4		M3x10	
95	Nutmutter	Groove nut	1	1.3	M22x1,5	0302021879
95-1	Scheibe	Washer	1		6	
95-2	Innensechskantschraube	Socket head screw	1		M6x12	
96-1	Sicherungsring	Circlip	1	1.1		034021001105
98	Kabelentlastung	Cable discharge	1			
100	Deckel	Cover	1	1.1		03020245240
101	Schaltkasten	Switch box	1			03020245241
102	Kabelentlastung	Cable discharge	1			
157	Hauptschalter	Main switch	1			0302024187
158	Label	Label	1			
159	Innensechskantschraube	Socket head screw	1		DIN4762-M5x12	
160	Scheibe	Washer	1			
161	Block	Block	1			03020420161
162	Hülse	Sleeve	1			03020420162
163	Gewindestift	Grub screw	2		DIN4028-M8x8	
164	Hebel	Lever	1			03020420164
165	Flachriemen	Flat belt	1		CW-B-28-1076/ 1114	03020420165
166	Riemenscheibe	Pulley	1			03020420166
167	Riemenscheibe	Pulley	1			03020420167
168	Spindel	Spindle	1			03020420168
169	Passfeder	Fitiing key	1		DIN 6885-4x4x12	042P4412
170	Kugellager	Ball bearing	2		51200	04051200
171	Bolzen	Bolt	1			03020420171
172	Lagerbock	Bearing block	1			03020420172
173	Passfeder	Fitiing key	1		DIN 6885-8x7x70	
174	Sechskantmutter	Hexagon nut	1		DIN 4032-M10	
175	Kegelrad	Bevel gear	1			03020420175
176	Kegelrad	Bevel gear	1			03020420176
177	Buchse	Bushing	1			03020420177
178	Kugellager	Ball bearing	2		6001-2Z	0406001ZZ
179	Welle	Shaft	1			03020420179
180	Passfeder	Fitiing key	2		DIN 6885-4x4x12	042P4412

181	Deckel	Cover	1			03020420181
182	Handrad	Handle	1			03020420182
183	Hebel	Lever	2			03020420183
184	Drehzahlanzeige	Rotation speed indicator	1			
185	Drehzahlsensor	Rotation speed sensor	1			
186	Mitnehmer	Actuator	1			
187	Passfeder	Fitiing key	1		DIN 6885-8x7x70	
188	Gehäuse	Housing	1			
189	Motor	Motor	1			03020420189
190	Sicherungsgehäuse	Fuse housing	3			
191	Sicherung	Fuse	2		2A	
192	Sicherung	Fuse	1		4A	
193	Lüfterrad	Fan wheel	1			
194	Motordeckel	Motor cover	1			03020420189FWC
200	Druckplatte	Presssure plate	1			
201	Platte	Plate	2			03020440142
202	Klemmmutter	Clamping nut	1			
203	Buchse	Bushing	1			03020420203
204	Scheibe	Washer	1			03020420204
205	Hülse	Sleeve	1			03020420205
206	Motorplatte	Motor plate	1			03020420206
207	Rändelschraube	Knurled screw	2			
208	Gleitlager	Plain bearing	1		18x20x8	03020241164
209	Gleitlager	Plain bearing	1		32x36x22	
231	Druckplatte	Pressure plate	1			03020420231
232	Spannhebel	Clamping lever	1			03020420232
233	Nabe	Collar	1			03020420233
234	Flansch	Flange	1			03020420234
235	Passfeder	Fitting key	1		4x4x16	042P4416
236	Zahnritzel	Gear schaft	1			03020420236
237	Verstellwelle	Setting shaft	1			03020420237
238	Feder	Spring	1			03020420238
239	Scheibe	Washer	1			
240	Schraube	Screw	1		M8x30	
241	Bohrtisch	Drilling machine table	1	ab / from 08/2019		03020420241
0	Transformator (ohne Abbildung)	Transformer (without illustration)	1			0302024196
0	Schütz (ohne Abbildung)	Contactor (without illustration)	1		230V 16A	0460025
0	Schalter Bohrfutterschutz	Switch drill chuck	1		230V 0,5A	030031712018

Ersatzteilliste Maschinenschilder - Spare part list machine labels

Pos.	Bezeichnung	Designation	Menge		Grösse	Artikelnummer
			Qty.		Size	Item no.
1	Schild Frontlabel	Front cover lable	1			
2	Maschinenschild	Machine lable	1			
3	Schild Hauptschalter	Main switch lable	1			
4	Schild Motor	Motor lable	1			

DH24BV_parts.fm

5	Schild Drehzahlverstellung	Spped adjustment lable	1			
6	Schild Sicherheit	Safety lable	1			
7	Schild Werkzeugaustreiber	Tool drift lable	1			
8	Schild Sicherheit	Safety lable	1			

7.10 DH28BV - Bohrkopf - Drilling head

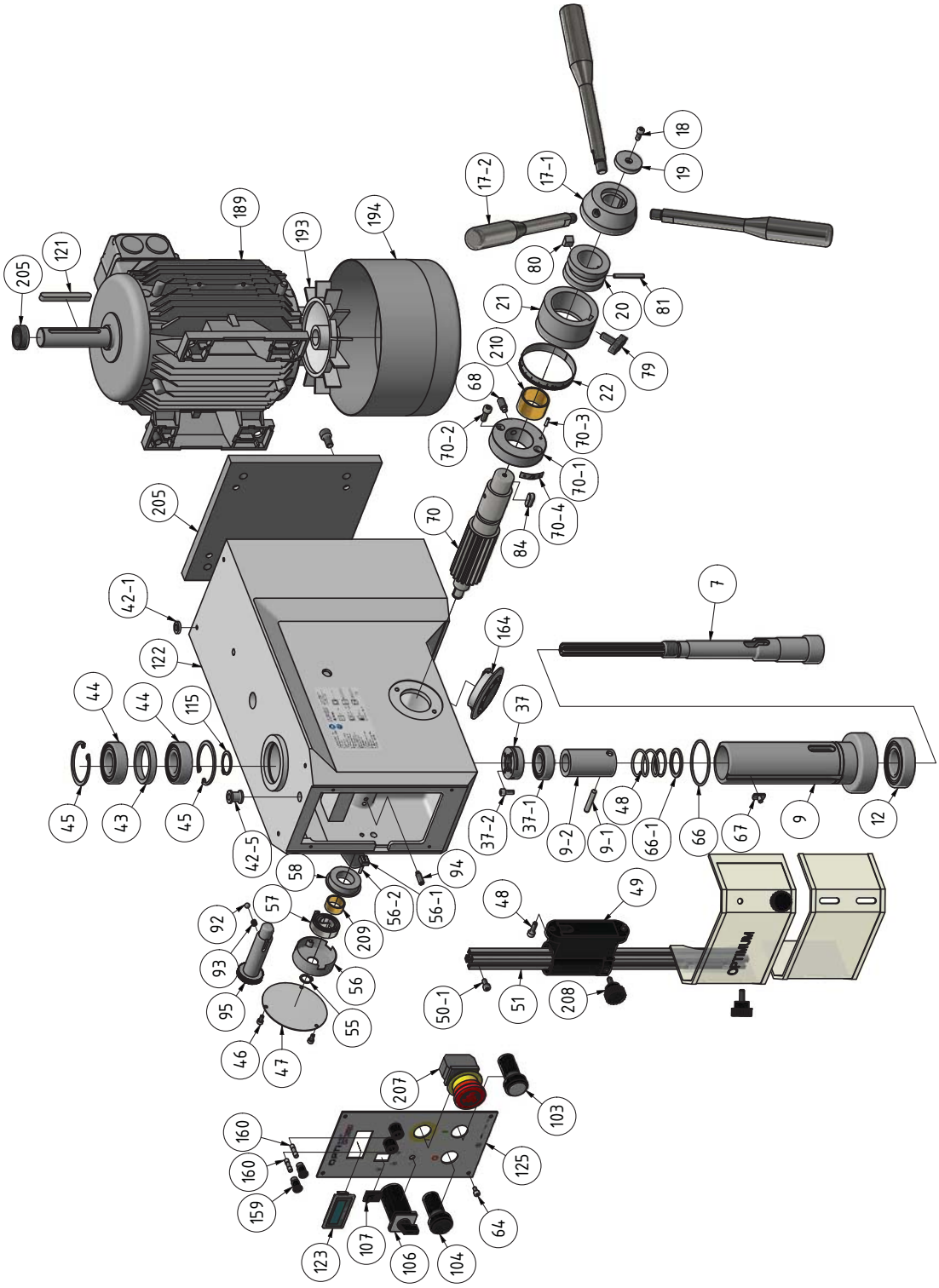


Abb. 7-7: Bohrkopf DH28BV - Drilling head DH28BV

DH28BV_parts.fm

7.11 DH28BV - Säule und Bohrtisch - Column and drilling table

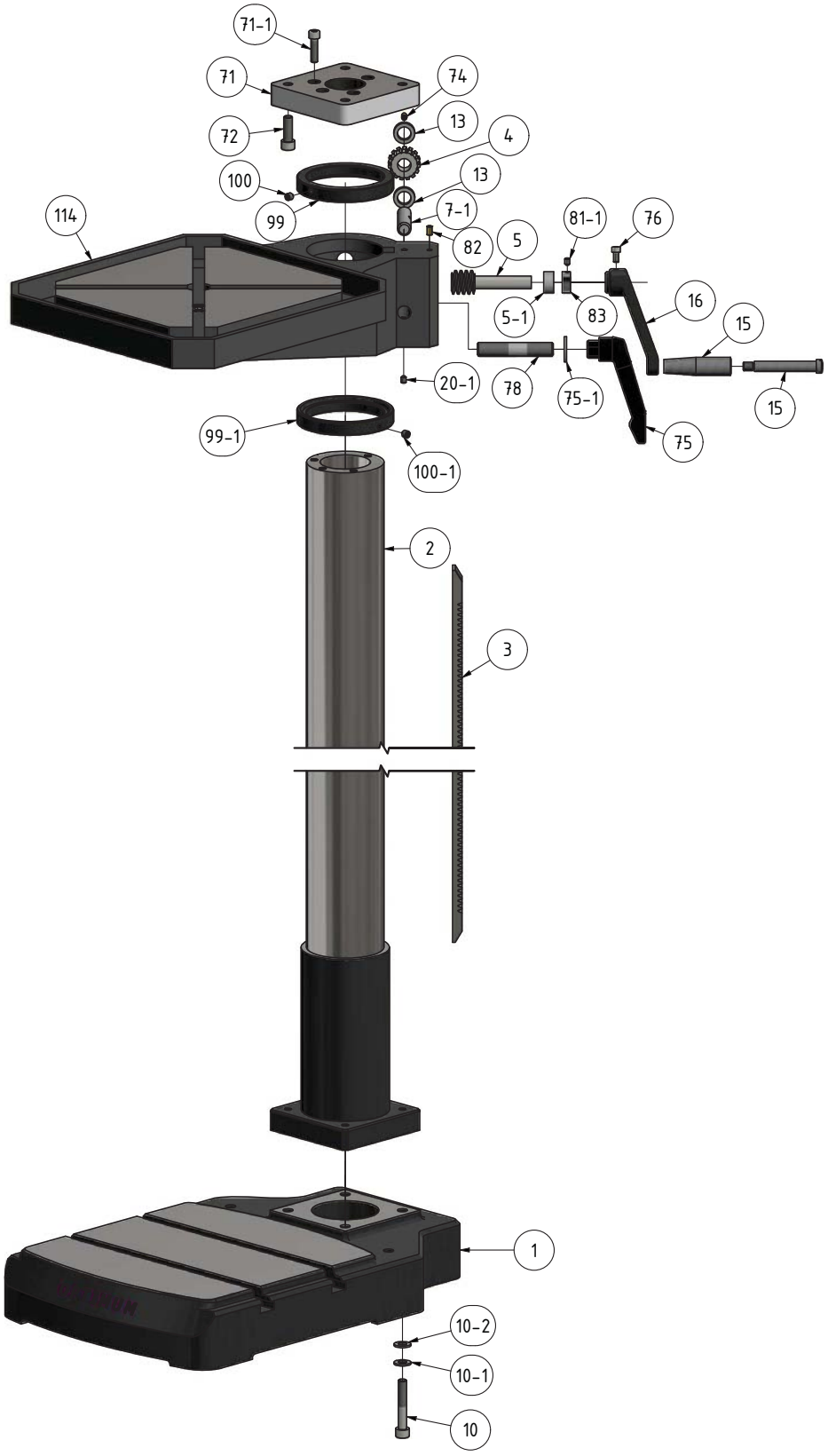


Abb.7-8: Säule und Bohrtisch DH28BV - Column and drilling table DH28BV

DH28BV_parts.fm

7.12 DH28BV - Antrieb - Drive - Version 1.0

Abb. 7-9: Antrieb DH28BV -Drive DH28BV

DH28BV_parts.fm

7.13 DH28BV - Antrieb - Drive - Version 1.1

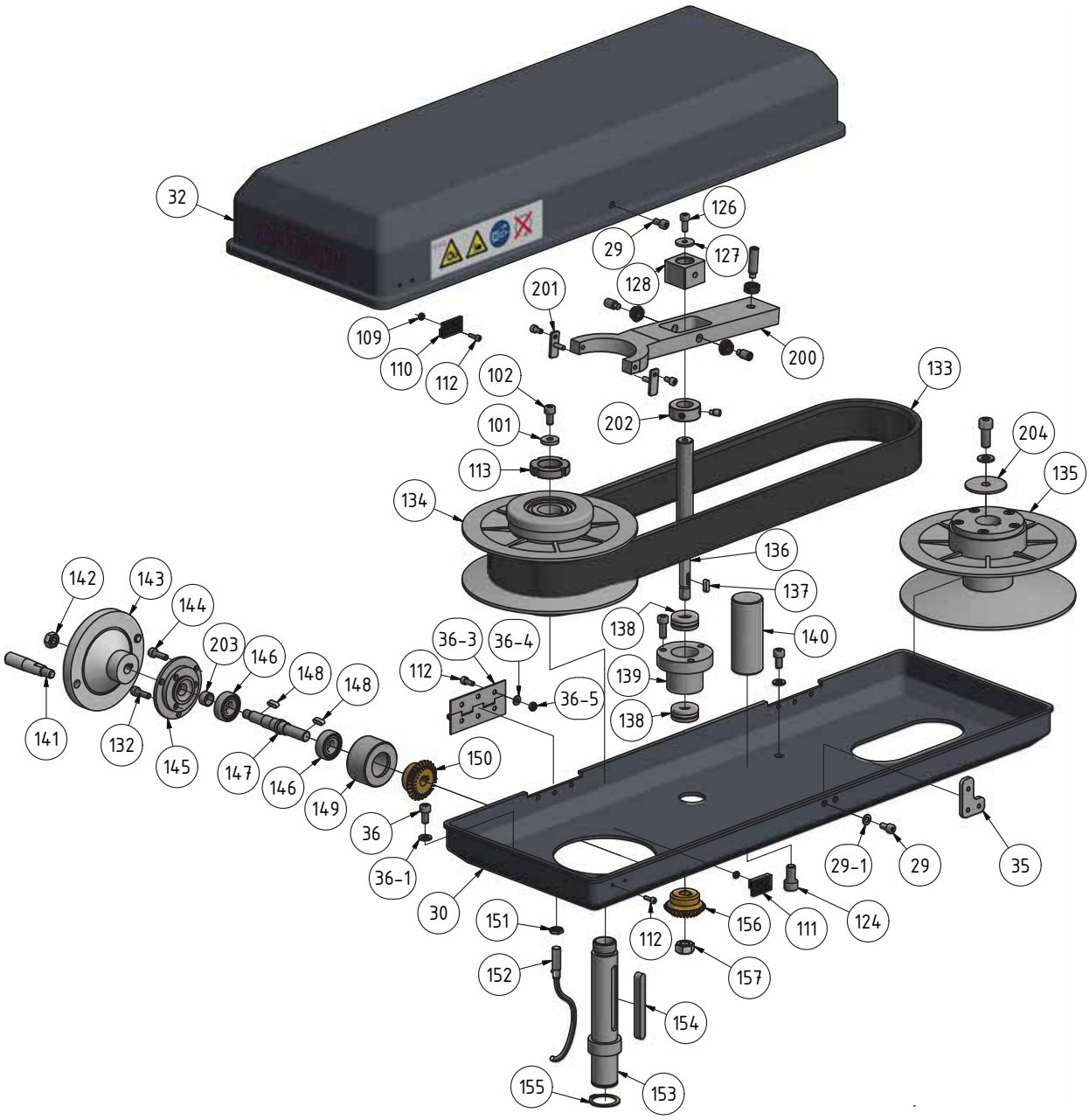


Abb.7-10: Antrieb DH28BV -Drive DH28BV

DH28BV_parts.fm

7.14 DH28BV - Antrieb - Drive - Version 1.2

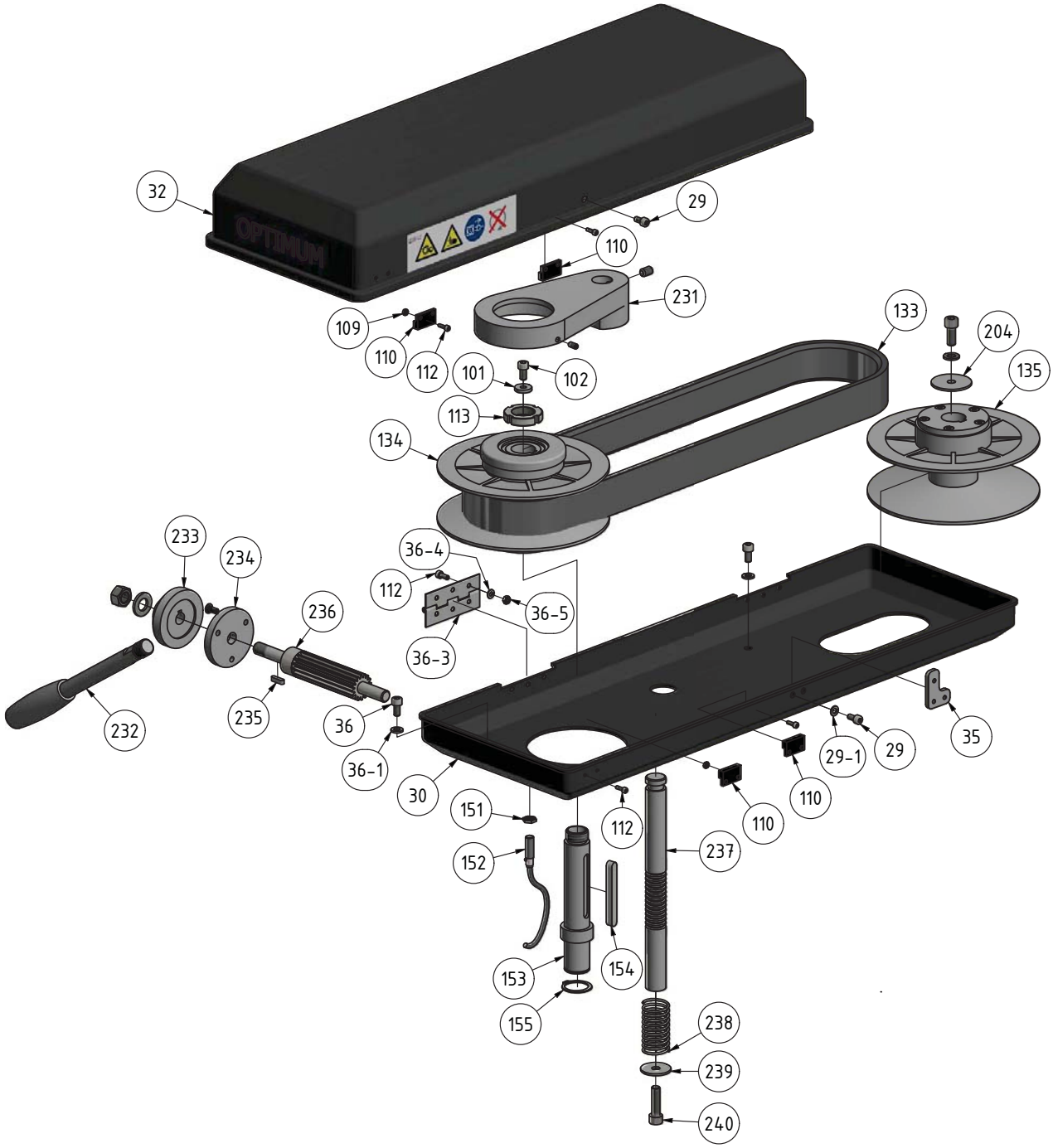


Abb.7-11: Antrieb DH28BV -Drive DH28BV

DH28BV_parts.fm

7.15 DH28BV - Maschinenschilder - Machine labels

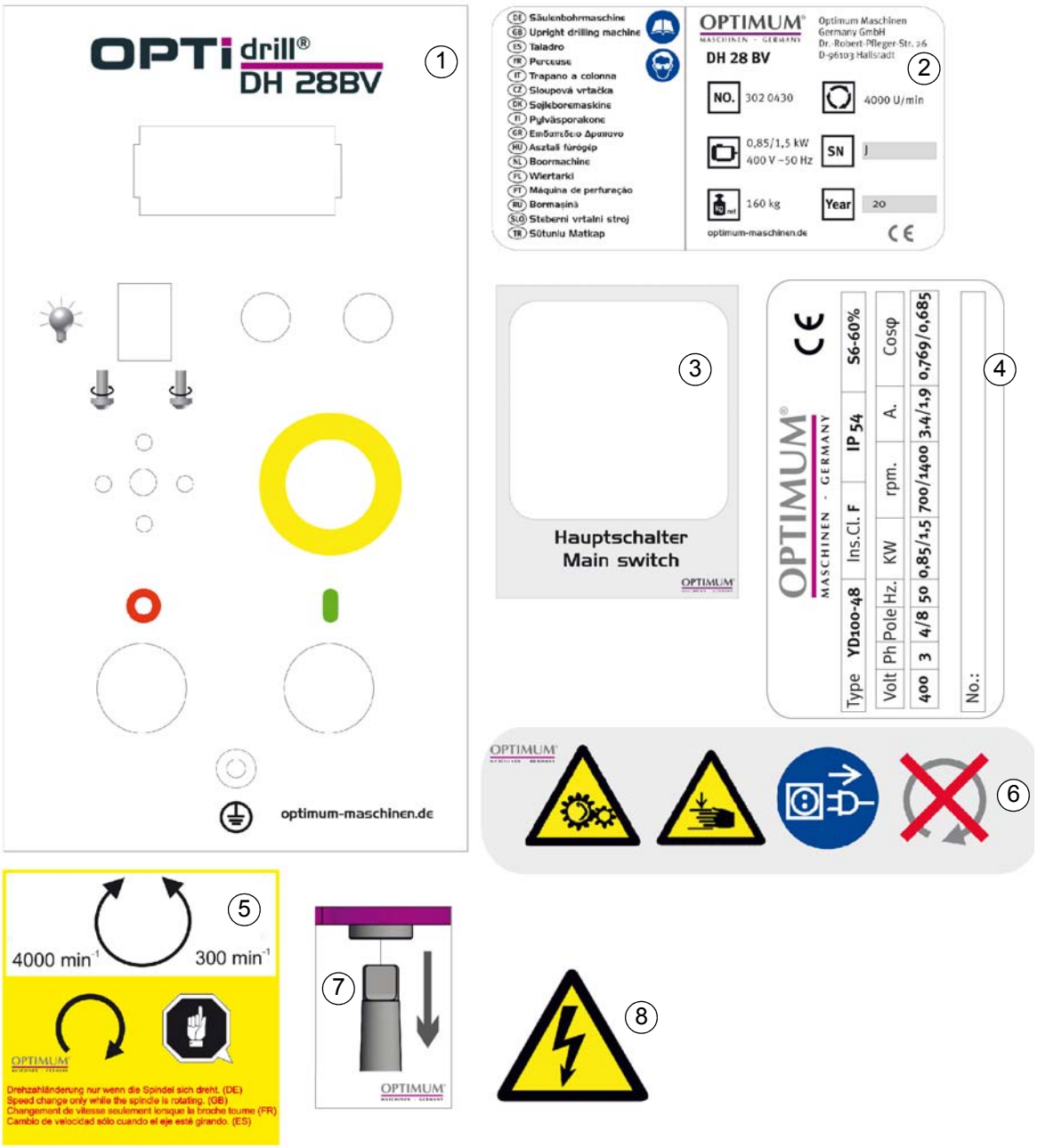


Abb.7-12: Maschinenschilder - Machine labels

DH28BV_parts.fm

7.15.1 DH28BV - Ersatzteilliste - Spare parts list

DH24BV						
Pos.	Bezeichnung	Designation	Menge		Grösse	Artikelnummer
			Qty.	Abb.	Size	Item no.
1	Standfuss	Base	1	1.2		030202411
2	Bohrsäule	Column	1	1.2		030202412
3	Zahnstange	Toothed rack	1	1.2		030202413
4	Zahnrad	Toothed wheel	1	1.2		030202414
5	Antriebsschnecke	Drive screw	1	1.2		030202415
5-1	Distanzscheibe	Spacer	1			
7	Spindel	Spindle	1	1.1		030202417
8	Flachriemen	Flat belt	1	o. Abb.		030202418
9	Pinole	Spindle sleeve	1	1.1		030202419
CPL	Pinole komplett	Sleeve complete	1	1.1		030202419CPL
10	Innensechskantschraube	Socket head screw	4		M10x60	
10-1	Scheibe	Washer	4		GB/T93-1987-10	
10-2	Scheibe	Washer	4		GB/T97.1-1985-10	
11-1	Innensechskant - Stiftschraube	Threaded pin	1		M6x6	
12	Kugellager	Ball bearing	1	o. Abb.	6205	0406205R
12-1	Stecker- Netzanschluss 400 V	Connector electric supply 400V	1			
13	Distanzhülse	Spacer	2	1.2		0302024113
14	Schraube	Screw	1	1.2	JB-T7270.4-1994-2	03020219139
15-1	Griff komplett	Handle complete	1		JB-T7270.4-1994	
16	Handkurbel	Crank	1	1.2		0302024116
17	Pinolenvorschubgriff	Spindle sleeve feed grip	1	1.1		0302024117
18	Innensechskantschraube	Socket head screw	1		M5x25	
19	Scheibe	Plate	1	1.1		0302024119
20	Buchse Skala	Bushing scale	1	1.1		0302024120
21	Skalenring	Scale ring	1	1.1		0302024121
22	Skala	Scale	1	1.1		0302024122
29	Innensechskantschraube	Socket head screw	3		M5x10	
29-1	Scheibe	Washer	3		5	
30	Riemengehäuse Unterteil	Belt housing bottom part	1	1.3		0302024132U
30-1	Scharnier	Articulation	2			
30-2	Scheibe	Washer	12		4	
30-3	Sechskantmutter	Hexagonal nut	12		M4	
31-1	Innensechskant - Stiftschraube	Threaded pin	1			
32	Riemengehäuse Oberteil	Belt housing upper part	1	1.3		0302024132D
35	Platte Schließer	Plate closer	1	1.3		0302024135
36	Innensechskantschraube	Socket head screw	4		M6x12	
37	Spindelmutter	Spindle nut	1	1.1		0302024137
37-1	Kugellager	Ball bearing	1	1.1	6003-2Z	0406003ZZ
37-2	Innensechskantschraube	Socket head screw	2		M4x8	

41	Motorplatte	Engine plate	1	o. Abb.		0302024141
42-1	Scheibe	Washer	4			
42-4	Buchse	Bushing	1			
43	Distanzring	Spacer ring	1			
44	Kugellager	Ball bearing	2	1.1	6005	0406005R
45	Sicherungsring	Circlip	2	1.1	DIN472 47x1.6	042SR47W
46	Innensechskantschraube	Socket head screw	3		M4x10	
47	Abdeckplatte	Covering plate	1			
48	Innensechskantschraube	Socket head screw	2		M6x30	
48-1	Innensechskantschraube	Socket head screw	1			
49	Halterung Bohrfutterschutz	Fixing drill chuck proetection	1	1.1		0302024149CPL
50	Griffschraube	Knurled screw	1	1.1	M6x30	03020241535
51	Arm Bohrfutterschutz	Arm drill chuck protection	1		20x20	
53	Sichtschutzscheibe Bohrfutterschutz	View sealing pane drill chuck protection	1	1.1		0302024153
55	Sicherungsring	circlip	1	1.1	DIN471-12x1	042SR12W
57	Spiralfeder inkl. Gehäuse	Spiral spring incl. Housing	1	1.1		0302024157
58	Buchse verzahnte Welle	Bushing toothed shaft	1	1.1		0302024158
58-1	Spannstift	Split pin	2	1.1	3x12	03020241581
58-2	Spanner Spiralfeder	Spanner spiral spring	1	1.1		03020241582
62	Innensechskantschraube	Socket head screw	4		M4x8	
63	Lichtschalter	Machine lightning switch	1		250V 6A	
64	Innensechskantschraube	Socket head screw	12		M4x10	
65	Innensechskantschraube	Socket head screw	2		M6x20	
66	O-Ring	O-ring	1	1.1		0302024166
67	Nutenstein	sliding block	1	1.1		0302024167
68	Gewindestift	Setscrew	1		M8x15	
69	Deckel Beleuchtung	Cover illumination	1	1.1		0302024169
69-1	Glühlampe (Diode)	Lamp (diode)	1	o. Abb.	12V / 20W	046423800
70	Schaftrizel mit Nabe	Shank pinion	1	1.1		0302024170
70-2	Anzeige Skala	Mechanicel indicator scale	1	1.1		03020241702
70-3	Ring	Ring	1	1.1		03020241703
70-4	Innensechskantschraube	Socket head screw	2		M6x16	
70-5	Spannstift	Spring pin	1			
71	Platte	Plate	1	1.2	M8x30	0302024171
71-1	Innensechskantschraube	Socket head screw	4			
72	Innensechskantschraube	Socket head screw	4		M10x25	
73	Welle	Shaft	1	1.2		0302024173
74	Oeler	Oiler	4	1.2		0340105
75	Klemmhebel	Clamping lever	1	1.2		0302024175
76	Innensechskantschraube	Socket head screw	1		M6x20	
77	Innensechskantschraube	Socket head screw	1		M12x60	
78	Klemmschraube	Clamping screw	1	1.2	M12x60	0302024178
78-1	Scheibe	Washer	1		12	
79	Griffschraube	Knurled screw	1	1.2	M8x20	0302024179
80	Nutenstein	Sliding block	1	1.1		0302024180
81	Zylinderstift	Straight pin	1		6x40	

82	Öler	Pressure Oil Cup	2			
83	Distanzhülse	Spacer	1	1.2		0302024183
83-1	Innensechskant - Stiftschraube	Threaded pin	1		M6x6	
84	Paßfeder	Key	1	1.1	8x8x18	042P8820
85	Drucktaster Ein	Bush button On	1	1.1	230V 5A	0302024185
85-1	Betriebskontrolleuchte	Operating control light	1	1.1	24V	046690349
86	Drucktaster Aus	Bush button Off	1	1.1	230V 5A	0302024186
88	Schalter Drehrichtung	Switch for direction of rotation	1	1.1	250V 24V/12A 50Hz	0460009
89	Schalter Licht	Light switch	1	1.1	250V 6A	0460005
90	Schalter NOT-Halt	Emergency- stop switch	1	1.1	600V 10A	0460058
91	Gegenstück Reedkontakt	Counterpart reed contact	2			
92	Reed Kontakt	Reed contact	2	1.3	PS-3150	0302024192
93	Sechskantmutter	Nut	4		M4	
94	Innensechskantschraube	Socket head screw	4		M3x10	
95	Nutmutter	Groove nut	1	1.3	M22x1,5	0302021879
95-1	Scheibe	Washer	1		6	
95-2	Innensechskantschraube	Socket head screw	1		M6x12	
96-1	Sicherungsring	Circlip	1	1.1		034021001105
98	Kabelentlastung	Cable discharge	1			
100	Deckel	Cover	1	1.1		03020245240
101	Schaltkasten	Switch box	1			03020245241
102	Kabelentlastung	Cable discharge	1			
157	Hauptschalter	Main switch	1			0302024187
158	Label	Label	1			
159	Innensechskantschraube	Socket head screw	1		DIN4762-M5x12	
160	Scheibe	Washer	1			
161	Block	Block	1			03020420161
162	Hülse	Sleeve	1			03020420162
163	Gewindestift	Grub screw	2		DIN4028-M8x8	
164	Hebel	Lever	1			03020420164
165	Flachriemen	Flat belt	1		CW-B-28-1076/ 1114	03020420165
166	Riemenscheibe	Pulley	1			03020420166
167	Riemenscheibe	Pulley	1			03020420167
168	Spindel	Spindle	1			03020420168
169	Passfeder	Fitiing key	1		DIN 6885-4x4x12	042P4412
170	Kugellager	Ball bearing	2		51200	04051200
171	Bolzen	Bolt	1			03020420171
172	Lagerbock	Bearing block	1			03020420172
173	Passfeder	Fitiing key	1		DIN 6885-8x7x70	
174	Sechskantmutter	Hexagon nut	1		DIN 4032-M10	
175	Kegelrad	Bevel gear	1			03020420175
176	Kegelrad	Bevel gear	1			03020420176
177	Buchse	Bushing	1			03020420177
178	Kugellager	Ball bearing	2		6001-2Z	0406001ZZ
179	Welle	Shaft	1			03020420179

180	Passfeder	Fitiing key	2		DIN 6885-4x4x12	042P4412
181	Deckel	Cover	1			03020420181
182	Handrad	Handle	1			03020420182
183	Hebel	Lever	2			03020420183
184	Drehzahlanzeige	Rotation speed indicator	1			
185	Drehzahlsensor	Rotation speed sensor	1			
186	Mitnehmer	Actuator	1			
187	Passfeder	Fitiing key	1		DIN 6885-8x7x70	
188	Gehäuse	Housing	1			
189	Motor	Motor	1			03020420189
190	Sicherungsgehäuse	Fuse housing	3			
191	Sicherung	Fuse	2		2A	
192	Sicherung	Fuse	1		4A	
193	Lüfterrad	Fan wheel	1			
194	Motordeckel	Motor cover	1			03020420189FWC
200	Druckplatte	Presssure plate	1			
201	Platte	Plate	2			03020440142
202	Klemmmutter	Clamping nut	1			
203	Buchse	Bushing	1			03020420203
204	Scheibe	Washer	1			03020420204
205	Hülse	Sleeve	1			03020420205
206	Motorplatte	Motor plate	1			03020420206
207	Rändelschraube	Knurled screw	2			
208	Gleitlager	Plain bearing	1		18x20x8	03020241164
209	Gleitlager	Plain bearing	1		32x36x22	
231	Druckplatte	Pressure plate	1			03020420231
232	Spannhebel	Clamping lever	1			03020420232
233	Nabe	Collar	1			03020420233
234	Flansch	Flange	1			03020420234
235	Passfeder	Fitting key	1		4x4x16	042P4416
236	Zahnritzel	Gear schaft	1			03020420236
237	Verstellwelle	Setting shaft	1			03020420237
238	Feder	Spring	1			03020420238
239	Scheibe	Washer	1			
240	Schraube	Screw	1		M8x30	
241	Bohrtisch	Drilling machine table	1	ab / from 08/2019		03020420241
0	Transformator (ohne Abbildung)	Transformer (without illustration)	1			0302024196
0	Schütz (ohne Abbildung)	Contactor (without illustration)	1		230V 16A	0460025
0	Schalter Bohrfutterschutz	Switch drill chuck	1		230V 0,5A	030031712018

Ersatzteilliste Maschinenschilder - Spare part list machine labels

Pos.	Bezeichnung	Designation	Menge		Grösse	Artikelnummer
			Qty.		Size	Item no.
1	Schild Frontlabel	Front cover lable	1			
2	Maschinenschild	Machine lable	1			
3	Schild Hauptschalter	Main switch lable	1			

DH28BV_parts.fm

4	Schild Motor	Motor lable	1			
5	Schild Drehzahlverstellung	Spped adjustment lable	1			
6	Schild Sicherheit	Safety lable	1			
7	Schild Werkzeugaustreiber	Tool drift lable	1			
8	Schild Sicherheit	Safety lable	1			

7.16 DH34BV | DH40BV - Bohrkopf - Drilling head

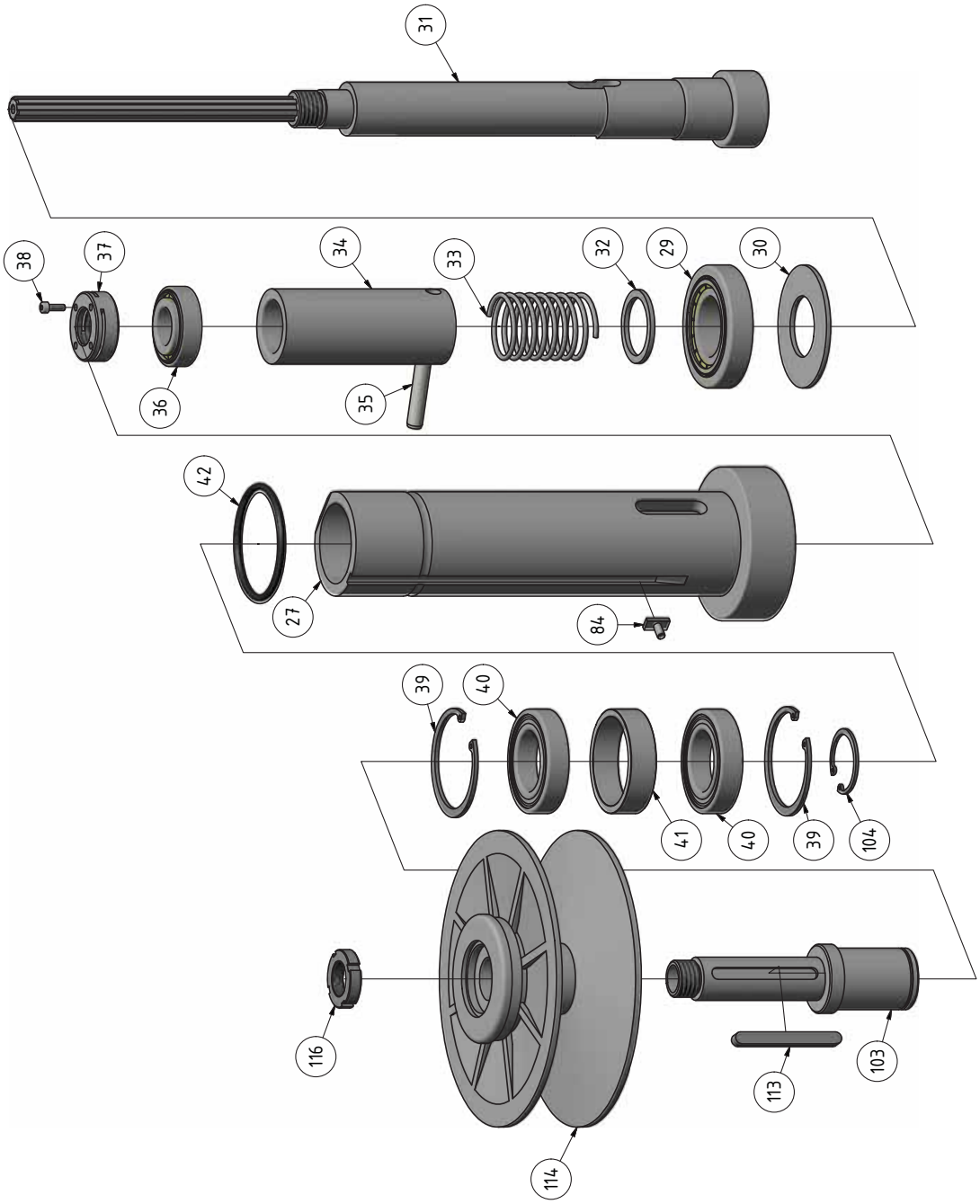


Abb. 7-13: Bohrkopf - Drilling head

DH34BV_DH40BV_parts.fm

7.17 DH34BV | DH40BV - Bohrkopf - Drilling head

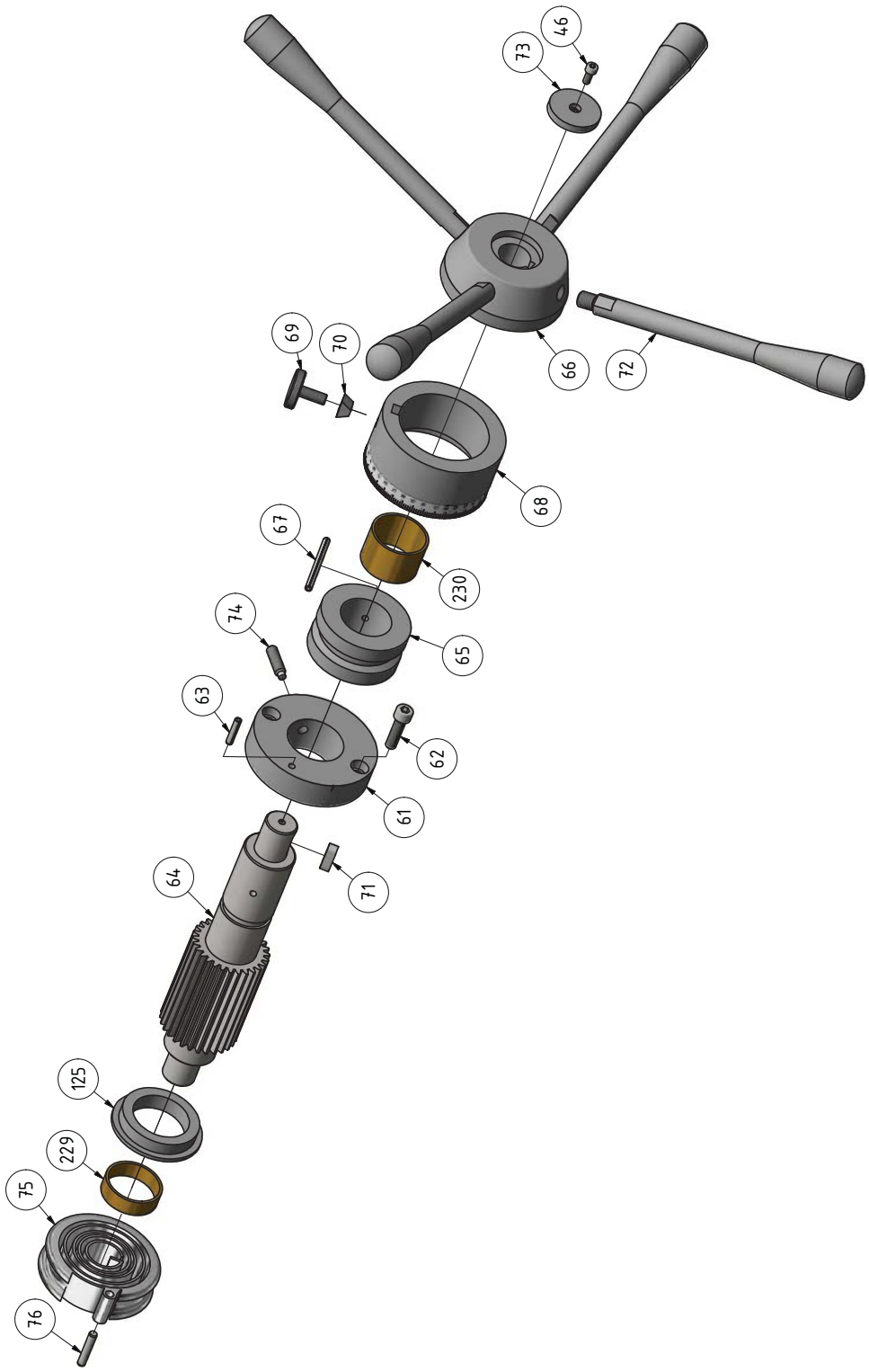


Abb.7-14: Bohrkopf - Drilling head

DH34BV_DH40BV_parts.fm

7.17.1 DH34BV - Bohrkopf - Drilling head - Version 1.0

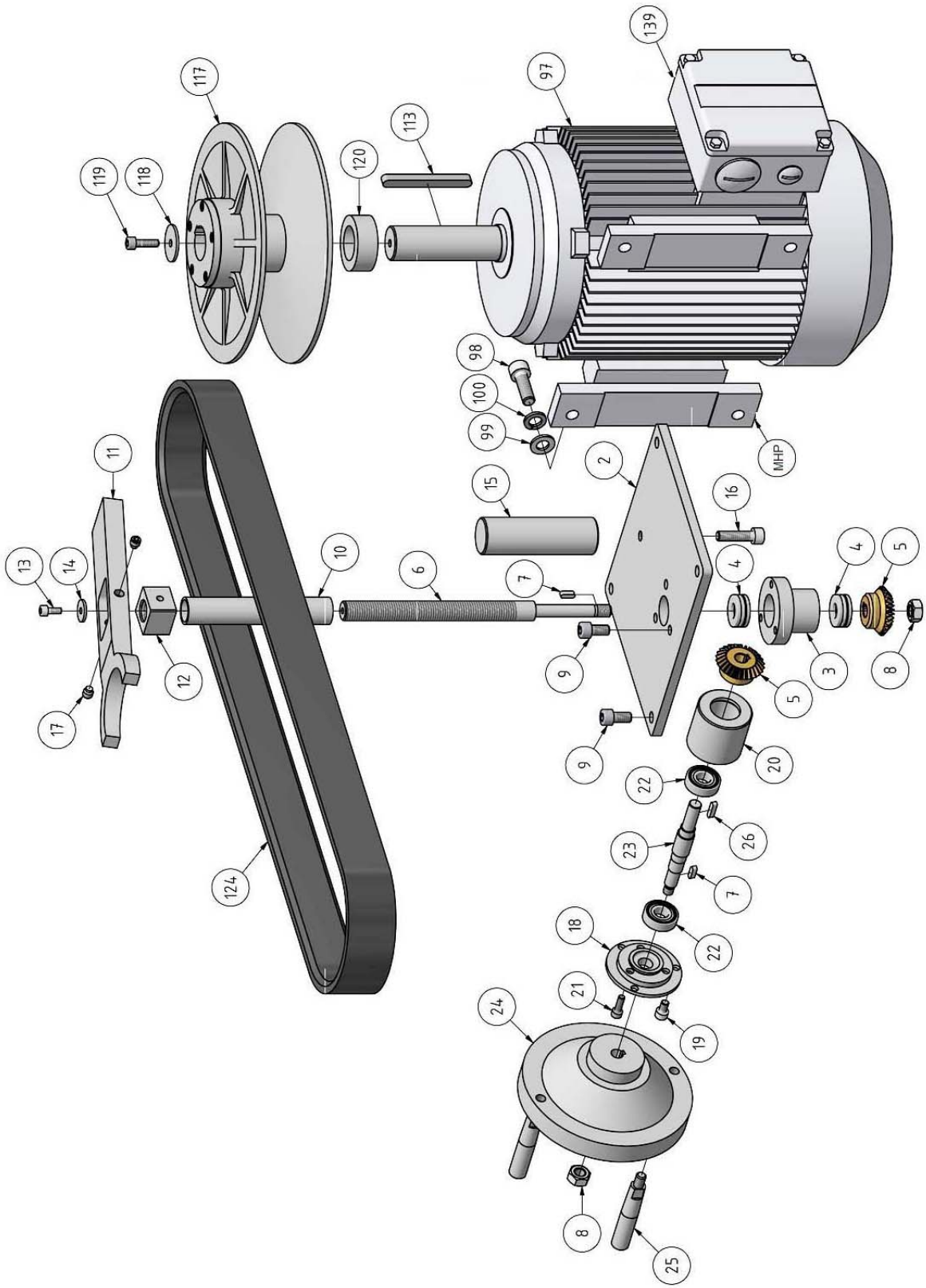


Abb. 7-15: Bohrkopf - Drilling head

DH34BV_DH40BV_parts.fm

7.17.2 DH34BV - Bohrkopf - Drilling head - Version 1.1

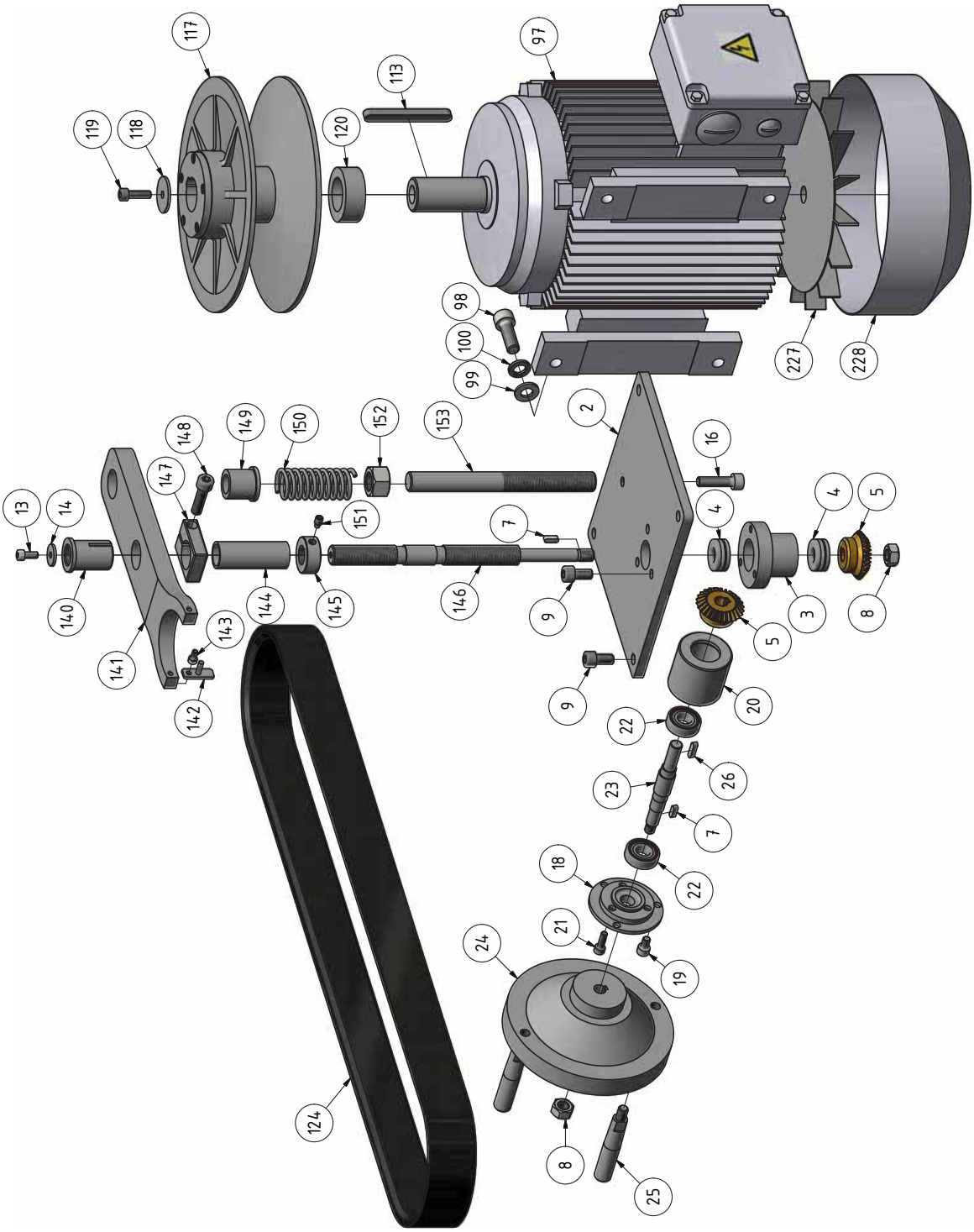


Abb. 7-16: Bohrkopf - Drilling head

DH34BV_DH40BV_parts.fm

7.17.3 DH40BV - Bohrkopf - Drilling head - Version 1.0

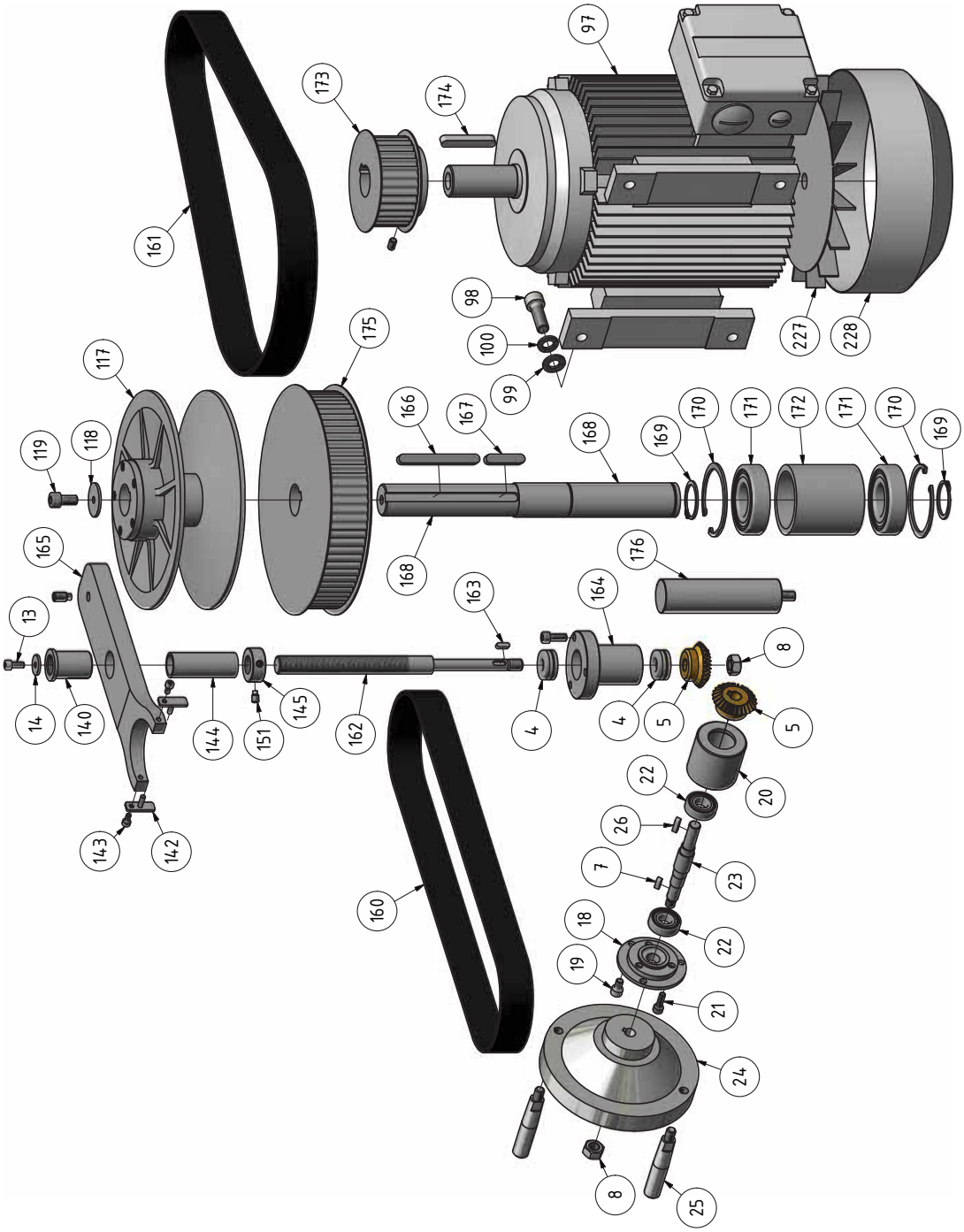


Abb. 7-17: Bohrkopf - Drilling head

7.17.4 DH40BV - Bohrkopf - Drilling head - Version 1.1

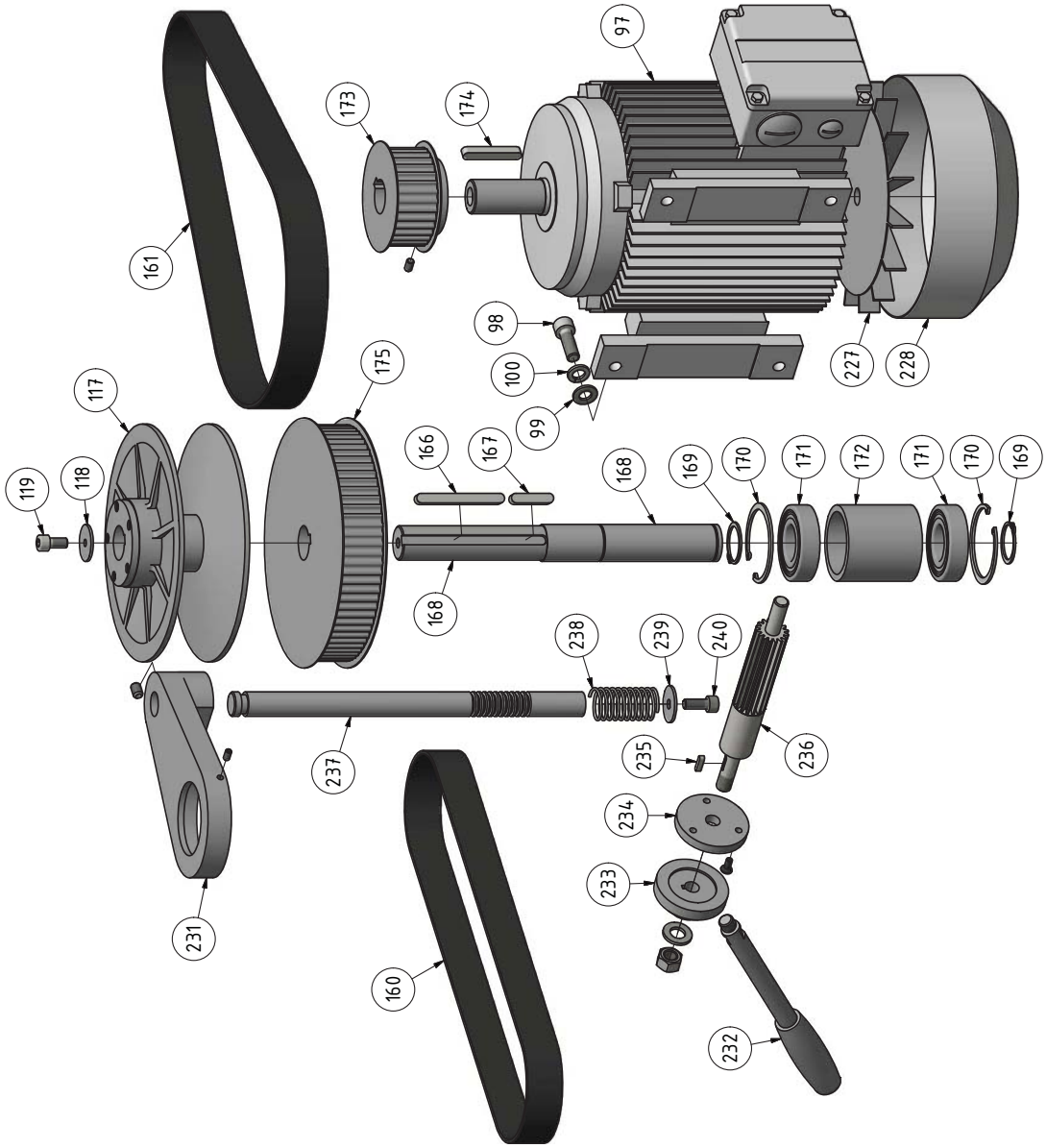


Abb.7-18: Bohrkopf - Drilling head

DH34BV_DH40BV_parts.fm

7.17.5 DH34BV | DH40BV - Bohrkopf - Drilling head - 4 of 5

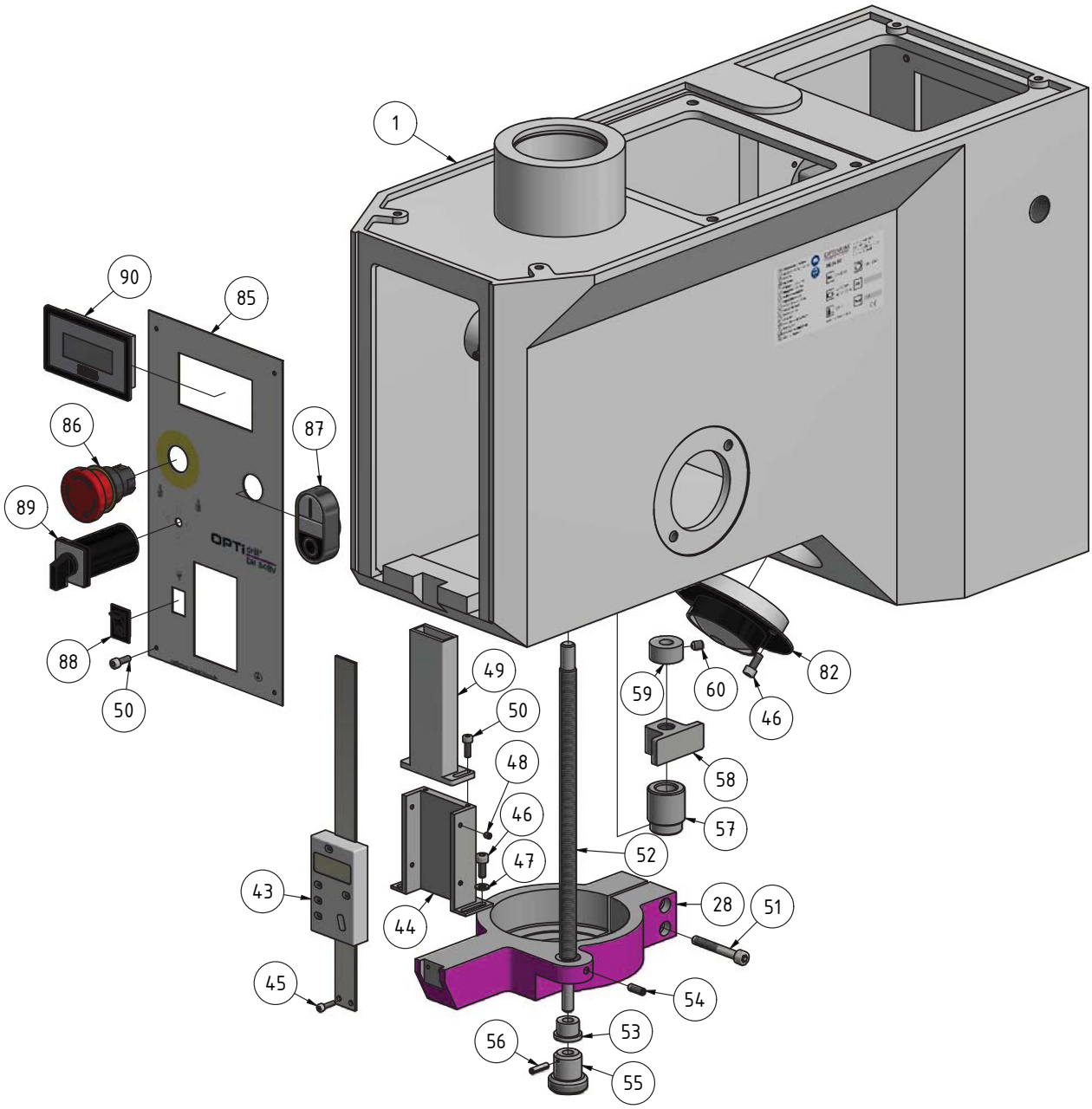


Abb. 7-19: Bohrkopf - Drilling head

DH34BV_DH40BV_parts.fm

7.17.6 DH34BV | DH40BV - Bohrkopf - Drilling head - 5 of 5

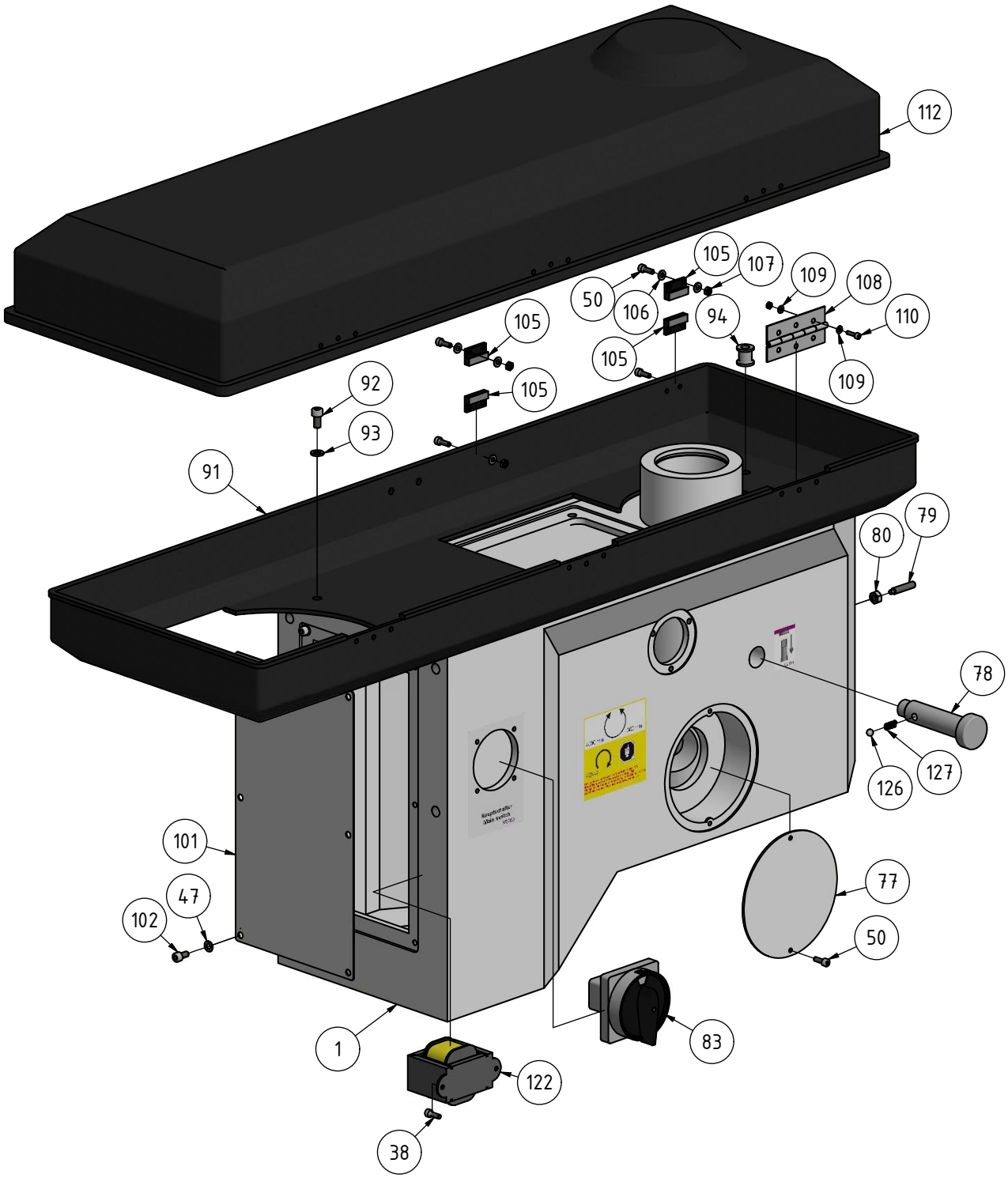


Abb.7-20: Bohrkopf - Drilling head

DH34BV_DH40BV_parts.fm

7.17.7 DH34BV | DH40BV - Bohrsäule - Drilling column

Abb. 7-21: Bohrsäule - Drilling column

DH34BV_DH40BV_parts.fm

7.17.8 DH34BV | DH40BV - Bohrfutterschutz - Drilling chuck protection

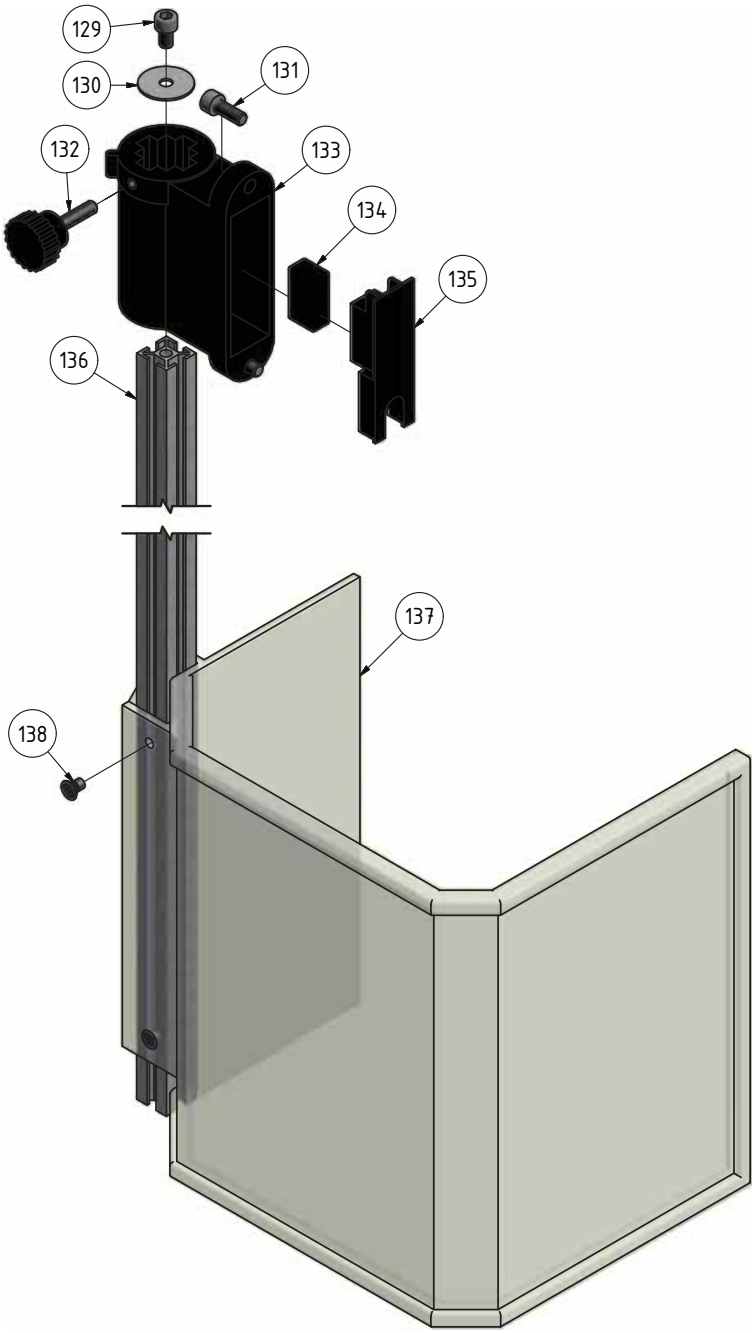


Abb. 7-22: Bohrfutterschutz - Drilling chuck protection

DH34BV_DH40BV_parts.fm

7.18 DH34BV | DH40BV - Maschinenschilder - Machine labels

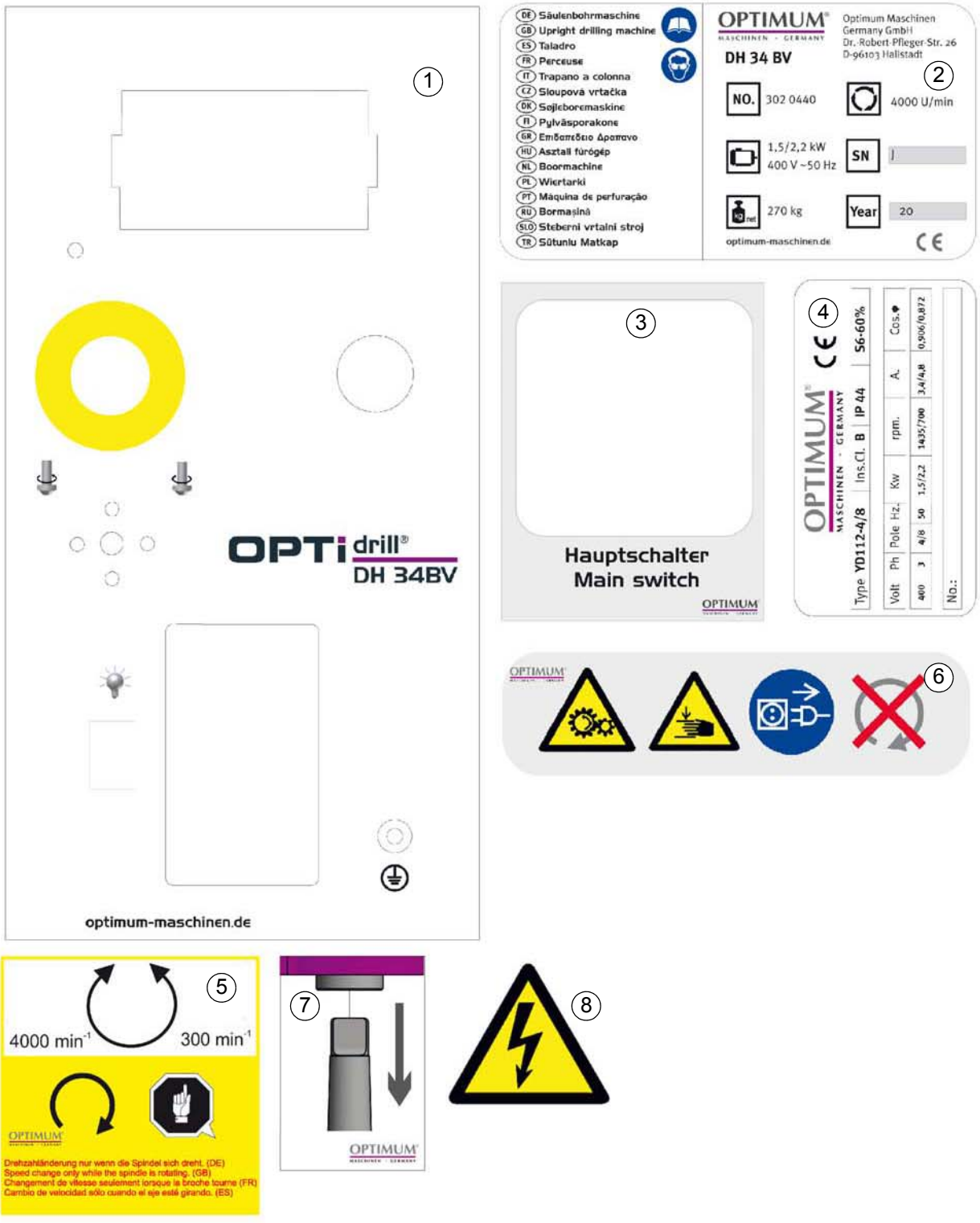


Abb. 7-23: Maschinenschilder - Machine labels

7.18.1 DH34BV | DH40BV - Ersatzteilliste - Spare parts list

Ersatzteilliste - Spare part list - DH34BV | DH40BV					
Pos.	Bezeichnung	Designation	Menge	Grösse	Artikelnummer
			Qty.	Size	Item no.
1	Gehäuse	Housing	1	DH34BV	
1	Gehäuse	Housing	1	DH40BV	
2	Platte	Plate	1		
3	Lagerbock	Bearing block	1		0302044003
4	Axiallager	Thrust bearing	2	51200	04051200
5	Kegelrad	Bevel gear	2		
6	Spindel	Spindle	1		0302044006
7	Passfeder	Fitting key	2	DIN 6885 - A 4 x 4 x 12	042P4412
8	Sechskantmutter	Hexagon nut	2	ISO 4032 - M10	
9	Innensechskantschraube	Socket head screw	7	ISO 4762 - M8 x 16	
10	Hülse	Sleeve	1		0302044010
11	Platte	Plate	1		
12	Spindelmutter	Spindle nut	1		0302044012
13	Innensechskantschraube	Socket head screw	1	ISO 4762 - M5 x 12	
14	Scheibe	Washer	1		
15	Bolzen	Bolt	1		
16	Innensechskantschraube	Socket head screw	1	ISO 4762 - M8 x 30	
17	Gewindestift	Grub screw	2	ISO 4028 - M8 x 8	
18	Flansch	Flange	1		
19	Innensechskantschraube	Socket head screw	3	ISO 4762 - M6 x 10	
20	Buchse	Bushing	1		0302044020
21	Innensechskantschraube	Socket head screw	3	ISO 4762 - M5 x 16	
22	Kugellager	Ball bearing	2	6001-2Z	0406001ZZ
23	Welle	Shaft	1		
24	Handrad	Handle	1		0302044024
25	Handgriff	Handle	2		0302044025
26	Passfeder	Fitting key	1	DIN 6885 - A 4 x 4 x 16	042P4416
27	Pinole	Sleeve	1		0302044027CPL
28	Aufnahme	Collet	1		0302033320
29	Kegelrollenlager	Taper roller bearing	1	30208	04030208
30	Ring	Ring	1		0302033319
31	Bohrspindel	Drilling spindle	1		0302044031
32	Ring	Ring	1		
33	Feder	Spring	1		0302033317
34	Hülse	Sleeve	1		0302033314
35	Zylinderstift	Cylindrical pin	1	GB 119-86 - B 10 x 50	
36	Kegelrollenlager	Taper roller bearing	1	30205	04030205
37	Klemmmutter	Clamping nut	1		0302033311
38	Innensechskantschraube	Socket head screw	4	ISO 4762 - M4 x 12	
39	Sicherungsring	Retaining ring	2	DIN 472 - 68 x 2,5	042SR68I

DH34BV_DH40BV_parts.fm

40	Kugellager	Ball bearing	2	6008-2RZ	0406008R
41	Abstandring	Spacer ring	1		0302044041
42	O-Ring	O-Ring	1	DIN 3771 - 67 x 5,3	042SR67W
43	Tiefenmesser	Depth indicator	1		0302033321
44	Abdeckung	Cover	1		0302130350
45	Innensechskantschraube	Socket head screw	2	GB 70-85 - M3 x 12	
46	Innensechskantschraube	Socket head screw	5	GB 70-85 - M5 x 12	
47	Scheibe	Washer	8	DIN 125 - A 5,3	
48	Gewindestift	Grub screw	4	GB 80-85 - M4 x 5	
49	Abdeckung	Cover	1		0302033386
50	Innensechskantschraube	Socket head screw	12	GB 70-85 - M4 x 12	
51	Innensechskantschraube	Socket head screw	2	GB 70-85 - M6 x 45	
52	Spindel	Spindle	1		0302033375
53	Buchse	Bushing	1		0302130388
54	Gewindestift	Grub screw	1	GB 78-85 - M5 x 14	
55	Rändelschraube	Knurled screw	1		0302033376
56	Spannstift	Spring pin	1	GB 879-86 - 4 x 16	
57	Buchse	Bushing	1		0302033380
58	Endanschlag	End stop	1		0302033381
59	Buchse	Bushing	1		0302033382
60	Gewindestift	Grub screw	1	GB 80-85 - M6 x 8	
61	Aufnahme	Collet	1		0302033327
62	Innensechskantschraube	Socket head screw	2	GB 70-85 - M8 x 30	
63	Spannstift	Spring pin	1	GB 879-86 - 5 x 24	
64	Zahnwelle	Gear shaft	1		0302033322
65	Buchse	Bushing	1		0302033332
66	Aufnahme	Collet	1		0302033337
67	Spannstift	Spring pin	1	GB 879-86 - 5 x 60	0302033335
68	Buchse	Bushing	1		0302033330
69	Rändelschraube	Knurled screw	1		0302033333
70	Klemmteil	Clamping piece	1		0302033332
71	Passfeder	Fitting key	1	DIN 6885 - A 8 x 7 x 25	042P8730
72	Hebel	Lever	4		0302130332
73	Scheibe	Washer	1		
74	Gewindestift	Grub screw	1	ISO 4028 - M8 x 30	0302033329
75	Rückholfeder	Return spring	1		0302130333
76	Zylinderstift	Cylindrical pin	1	GB 119-86 - B 6 x 32	
77	Abdeckung	Cover	1		0302033326
78	Bolzen	Bolt	1		0302033389
79	Gewindestift	Grub screw	1	GB 79-85 - M6 x 30	
80	Sechskantmutter	Hexagon nut	1	GB 6170-86 - M6	
81	Label Austreiber	Label drill drift	1		
82	Maschinenlampe	Machine lamp	1		03334400EL1
83	Hauptschalter	Main switch	1		0302024187
84	Führungsstück	Guide piece	1		03020333119
85	Frontlabel	Front label	1	DH34BV	

85	Frontlabel	Front label	1	DH40BV	0302045085
86	NOT-Halt-Schalter	Emergency stop button	1		0460058
87	Ein-Aus-Taster	On- Off switch	1		03338120S1.3
88	Lichtschalter	Light switch	1		0302033393
89	Funktionsschalter	Function switch	1		0460008
90	Drehzahlanzeige	Rotation speed indicator	1		03338120P1.3
91	Abdeckung	Cover	1		0302033357
92	Innensechskantschraube	Socket head screw	4	GB 70-85 - M6 x 12	
93	Scheibe	Washer	4	DIN 125 - A 6,4	
94	Buchse	Bushing	1		
95	Drehzahlsensor	Rotation speed sensor	1		03338120279
96	Sechskantmutter	Hexagon nut	2		
97	Motor	Motor	1		0302044097
98	Innensechskantschraube	Socket head screw	4	ISO 4762 - M10 x 30	
99	Scheibe	Washer	4	DIN 125 - A 10,5	
100	Federring	Spring ring	4	DIN 127 - A 10	
101	Abdeckung	Cover	1		03020333106
102	Innensechskantschraube	Socket head screw	6	ISO 4762 - M5 x 10	
103	Mitnehmer	Actuator	1		03020440103
104	Sicherungsring	Retaining ring	1	DIN 472 - 40 x 1,75	042SR40I
105	Reed Kontakt	Reed contact	2		
106	Scheibe	Washer	8	DIN 125 - A 4,3	
107	Sechskantmutter	Hexagon nut	4	ISO 4032 - M4	
108	Scharnier	Hinge	3		
109	Scheibe	Washer	36	DIN 125 - A 3,2	
110	Innensechskantschraube	Grub screw	18	ISO 4762 - M3 x 12	
111	Sechskantmutter	Hexagon nut	18	ISO 4032 - M3	
112	Abdeckung	Cover	1		0302033354
113	Passfeder	Fitting key	2	DIN 6885 - A 8 x 7 x 70	
114	Abtriebsscheibe	Driven pulley	1		03020440114
115	Scheibe	Washer	1		
116	Nutmutter	Groove nut	1	GB 810 M24 x 1,5	
117	Antriebsscheibe	Driving pulley	1		03020440117
118	Scheibe	Washer	1		
119	Innensechskantschraube	Grub screw	1	ISO 4762 - M6 x 20	
120	Abstandring	Spacer ring	1		03020440120
122	Transformator	Trafo	1		03020333118
123	Reed Kontakt	Reed contact	1		0302024192
124	Flachriemen	Flat belt	1		03020440124
125	Buchse	Bushing	1		0302033324
126	Stahlkugel	Steel ball	1	Ø6,3mm	042KU63
127	Druckfeder	Spring	1		
129	Innensechskantschraube	Socket head screw	1	GB 70-85 - M6 x 10	
130	Scheibe	Washer	1		
131	Innensechskantschraube	Socket head screw	2	GB 70-85 - M6 x 16	
132	Rändelschraube	Knurled screw	1		

133	Halterung	Fixture	1		0302024149CPL
134	Mikroschalter	Microswitch	1		030031712018V2
135	Platte	Plate	1		
136	Alu- Profil	Aluminium profile	1		
137	Bohrfutterschutz	Drill chuck protection	1		03334403170
138	Schraube	Screw	2	GB819-85/M5x8	
139	Klemmkasten	Clamping box	1		03020440MCB
MHP	Motorhalteplatte	Motor mountin plate	2		03020440MHP
Verstelleinheit Baujahr ab 07.2013 - Adjusting unit, year of production from 07.2013					
140	Klemmbuchse	Clamping bushing	1		03020440140
141	Platte	Plate	1		03020440141
142	Platte	Plate	2		03020440142
143	Innensechskantschraube	Socket head screw	2	ISO4762/M4x8	
144	Hülse	Sleeve	1		03020440144
145	Klemmmutter	Clampung nut	1		03020440145
146	Spindel	Spindle	1		03020440146
147	Klemmplatte	Clamping plate	1		03020440147
148	Innensechskantschraube	Socket head screw	1	ISO4762/M8x30	
149	Buchse	Bushing	1		03020440149
150	Feder	Spring	1		03020440150
151	Gewindestift	Grub screw	1	M6x10	
152	Sechskantmutter	Hexagon nut	1	DIN24032/M16	
153	Bolzen	Bolt	1		03020440153
160	Flachriemen	Flat belt	1		03020450160
161	Zahnriemen	Tooth belt	1		03020450161
162	Welle	Shaft	1		03020450162
163	Passfeder	Fitting key	1	4x4x12	042P4412
164	Flansch	Flange	1		
165	Druckplatte	Pressure plate	1		03020450165
166	Passfeder	Fitting key	1	8x7x70	
167	Passfeder	Fitting key	1	8x7x36	042P8735
168	Welle	Shaft	1		03020450168
169	Sicherungsring	Retaining ring	2	30x1,5	042SR30W
170	Sicherungsring	Retaining ring	2	62x2	042SR62I
171	Kugelager	Ball bearing	2	6206	0406206R
172	Hülse	Sleeve	1		03020450172
173	Zahnscheibe	Tooth wheel	1		03020450173
174	Passfeder	Fitting key	1	8x7x50	
175	Zahnscheibe	Tooth wheel	1		03020450175
176	Bolzen	Bolt	1		03020450176
200	Innensechskantschraube	Socket head screw	4	GB 70-85 - M6 x 10	
201	Zwischenplatte	Distance plate	1		0302130302
202	Buchse	Protection bush	1		
203	Axiallager	Axial bearing	1	51103/17x30x9	04051103
204	Stiftschraube	Locking screw	1		03020333136

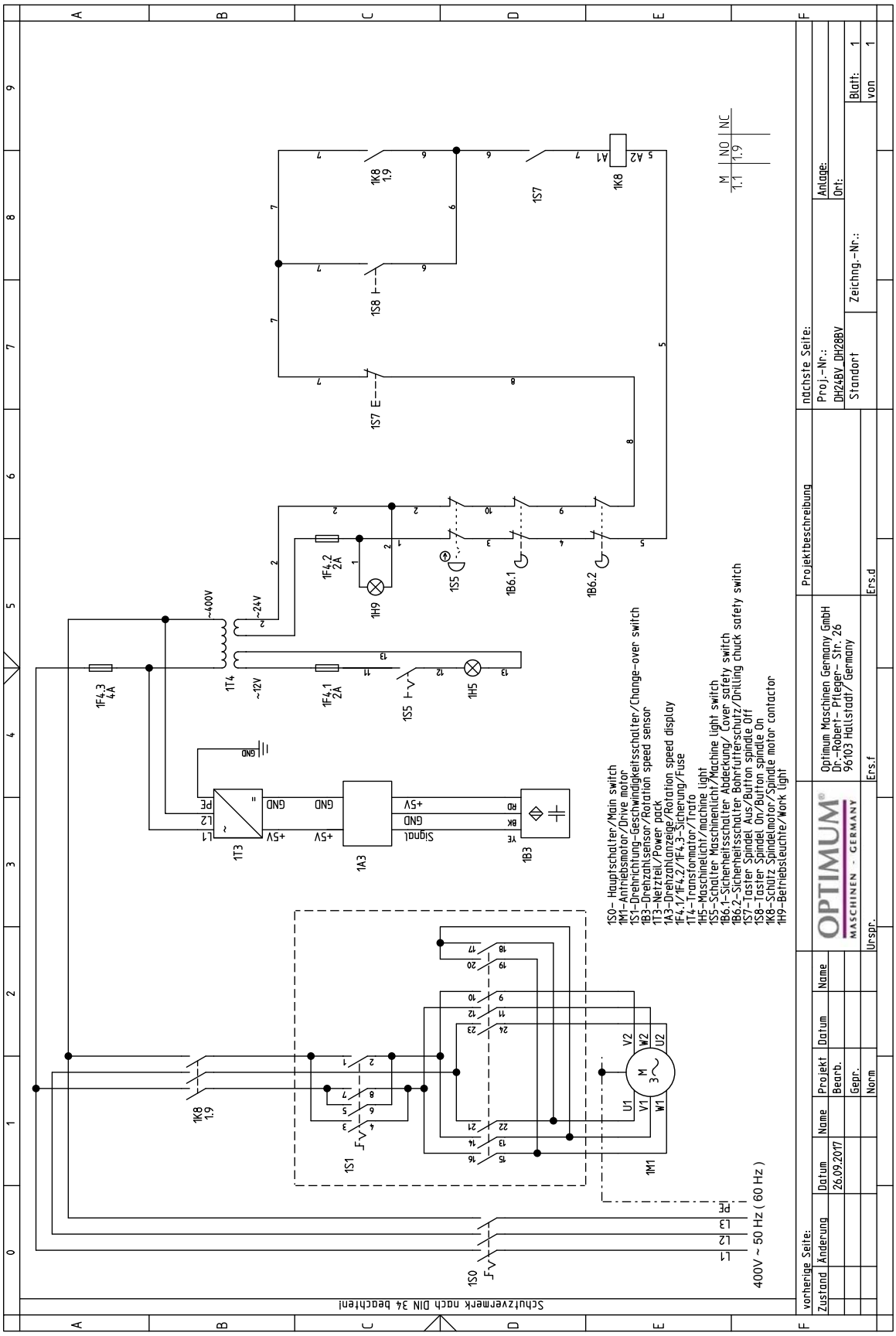
205	Klemmhebel	Clamping lever	1	HY8310.12-2	
206	Bohrtisch	Drilling table	1	DH34BV/DH40BV alt/ old	03020333138CPL
206	Bohrtisch	Drilling table	1	DH40BV neu /new	03020450206
207	Sechskantmutter	Hexagon nut	2	GB 6170-86 - M12	
208	Ringschraube	Ring bolt	2	AS 2317 - M12	
209	Schmiernippel	Lubrication cup	2		0340105
210	Schmiernippel	Lubrication cup	1		
211	Welle	Shaft	1		
212	Gewindestift	Grub screw	1	GB 77-85 - M8 x 12	
213	Gewindestift	Grub screw	2	M10x10	
214	Distanzhülse	Spacer	1		0302130319
215	Scheibe	Washer	2	GB 97.1-85 - 20	
216	Zahnstange	Toothead rack	1		030213036
217	Schneckenrad	Worm wheel	1		0302130310
218	Schnecke	Worm	1		030213039
219	Distanzhülse	Spacer	1		03020333151
220	Innensechskantschraube	Socket head screw	2	GB 70-85 - M8 x 16	
221	Kurbel	Crank	1		030213038
222	Griff	Handle	1		
223	Schraube	Screw	1		
224	Bohrsäule	Column	1		03020333156
225	Scheibe	Washer	5	DIN 125-A 14	
226	Standfuss	Base	1		03020333158
227	Lüfterrad	Fan wheel	1		
228	Motordeckel	Motor cover	1		
229	Gleitlager	Plain bearing	1		03020333167
230	Gleitlager	Plain bearing	1		03020333168
231	Druckplatte	Pressure plate	1		
232	Spannhebel	Clamping lever	1		03020420232
233	Nabe	Collar	1		03020420233
234	Flansch	Flange	1		03020420234
235	Passfeder	Fitting key	1	4x4x16	042P4416
236	Zahnritzel	Gear schaft	1		03020420236
237	Verstellwelle	Setting shaft	1		03020420237
238	Feder	Spring	1		03020420238
239	Scheibe	Washer	1		
240	Schraube	Screw	1	M8x30	

Ersatzteilliste Maschinenschilder - Spare part list machine labels

Pos.	Bezeichnung	Designation	Menge	Grösse	Artikelnummer
			Qty.	Size	Item no.
1	Schild Frontlabel	Front cover lable	1	DH34BV	
1	Schild Frontlabel	Front cover lable	1	DH40BV	
2	Maschinenschild	Machine lable	1	DH34BV	
2	Maschinenschild	Machine lable	1	DH40BV	
3	Schild Hauptschalter	Main switch lable	1	DH34BV	
3	Schild Hauptschalter	Main switch lable	1	DH40BV	

4	Schild Motor	Motor lable	1	DH34BV	
4	Schild Motor	Motor lable	1	DH40BV	
5	Schild Drehzahlverstellung	Spped adjustment lable	1	DH34BV	
5	Schild Drehzahlverstellung	Spped adjustment lable	1	DH40BV	
6	Schild Sicherheit	Safety lable	1		
7	Schild Werkzeugaustreiber	Tool drift lable	1		
8	Schild Sicherheit	Safety lable	1		

7.19 Schaltplan - Wiring diagram - DH24BV , DH28BV



Img.7-24: Schaltplan - Wiring diagram DH24BV, DH28BV

DH24BV_DH28BV_wiring-diagram.fm

7.19.1 Ersatzteilliste elektrische Bauteile - Spare parts electrical components

DH24BV - DH28BV - Ersatzteilliste elektrische Bauteile - Spare parts electrical components					
Pos.	**Bezeichnung**	**Designation**	**Menge**	**Grösse**	**Artikelnummer**
			Qty.	**Size**	**Item no.**
1S0	Hauptschalter	Main switch	1		030204201S0
1M1	Antriebsmotor	Drive motor	1		030204201M1
1S1	Drehrichtung/ Geschwindigkeitsschalter	Change-over switch	1		030204201S1
1B3	Drehzahlsensor	Rotation speed sensor	1		030204201B3
1T3	Netzteil	Power pack	1		030204201T3
1A3	Drehzahlanzeige	Rotation speed display	1		030204201A4
1F4.3	Sicherung	Fuse	1	4A	030204201F1
1F4.1	Sicherung	Fuse	1	2A	030204201F2
1F4.2	Sicherung	Fuse	1	2A	030204201F2
1T4	Transformator	Trafo	1		030204201T4
1H5	Maschinenlicht	Machine light	1		030204201H5
1S5	Schalter Maschinenlicht	Machine light switch	1		030204201S5
1B6.1	Sicherheitsschalter Abdeckung	Cover safety switch	1		030204201B61
1B6.2	Sicherheitsschalter Bohrfutterschutz	Drilling chuck safety switch	1		030204201B62
1S5	Not-Halt-Schalter	Emergency stop button	1		030204201S75
1S7	Taster Aus	Button Off	1		030204201S7
1S8	Taster Ein	Button On	1		030204201S8
1K8	Motorschütz	Motor contactor	1		030204201K8
1H9	Betriebsleuchte	Work light	1		030204201H9

7.20 Schaltplan - Wiring diagram - DH34BV | DH40BV

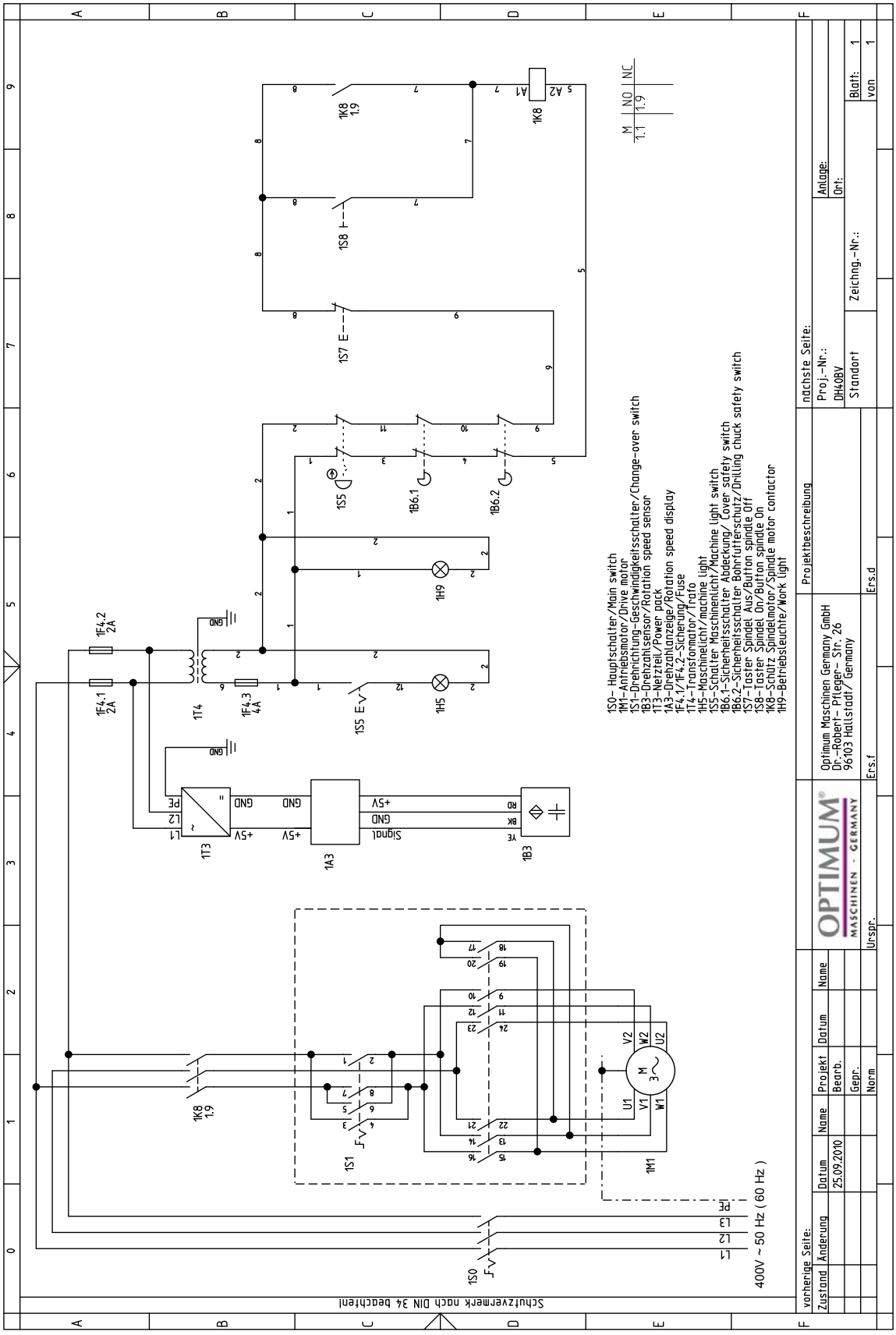


Abb.7-25: Schaltplan - Wiring diagram

DH34BV_DH40BV_wiring-diagram.fm

7.20.1 Ersatzteilliste elektrische Bauteile - Spare parts electrical components

DH34BV - DH40BV - elektrische Bauteile - electrical components					
Pos.	Bezeichnung	Designation	Menge	Grösse	Artikelnummer
			Qty.	Size	Item no.
1S0	Hauptschalter	Main switch	1		030204401S0
1M1	Antriebsmotor	Drive motor	1		030204401M1
1S1	Drehrichtung/Geschwindigkeitsschalter	Change-over switch	1		030204401S1
1B3	Drehzahlsensor	Rotation speed sensor	1		030204401B3
1T3	Netzteil	Power pack	1		030204401T3
1A3	Drehzahlanzeige	Rotation speed display	1		030204401A3
1F4.1	Sicherung	Fuse	1	2,5A	030204401F4
1F4.2	Sicherung	Fuse	1		
1F4.3	Sicherung	Fuse	1	4A	030204401F43
1T4	Transformator	Trafo	1		030204401T4
1H5	Maschinenlampe	Machine lamp	1		030204401H5
1S5	Schalter Maschinenlampe	Machine lamp switch	1		030204401S5
1B6.1	Sicherheitsschalter Abdeckung	Cover safety switch	1		030204401B6
1S6	Not-Halt-Schalter	Emergency stop button	1		030204401S6
1B6.2	Sicherheitsschalter Bohrfutterschutz	Drilling chuck safety switch	1		030204401B2
1S7	Taster Spindel Aus	Button spiindle Off	1		030204401S7
1S8	Taster spindle Ein	Button spindle On	1		030204401S8
1K8	Schütz Spindelmotor	Spindle motor contactor	1		030204401K8
1H9	Betriebsleuchte	Work light	1		030204401H9

8 Malfunctions

Malfunction	Cause/ possible effects	Solution
Motor is hot	• Wrong electrical connection of 400 V machines	•
Noise during work.	• Spindle is too little lubricated • Tool is blunt or wrongly clamped	• Lubricate spindle (only possible when disassembled) • Use new tool and check tension (fixed setting of the bit, drill chuck and taper mandril)
Drill "burns"	• Incorrect speed/feed too fast • Chips do not come out of the drill hole. • Drill blunt • No or too little cooling	• Select another speed • Extract drill more often during work • Sharpen or use new drill • Use cooling agent
Drill tip is running off centre, the drilled hole is non-round	• Hard points on the workpiece • Length of the cutting spirals/or angles on the tool are unequal • Drill deformed	• Use new drill
Drill is defective	• No base / support used.	• Use support and clamp it with the workpiece
Drill is running non-round or shaking	• Drill deformed • Worn out spindle bearings • Drill is not correctly clamped. • Drill chuck defective	• Use new drill • Have the spindle bearings replaced • Correctly clamp drill • Replace the drill chuck
It is not possible to insert the drill chuck or the taper mandrel	• Dirt, grease or oil on the taper inside of the drill chuck or on the taper surface of the drill spindle • Positioning the follower in the drill spindle is not considered	• Clean surfaces well • Keep surfaces free of grease
Motor does not start	• Motor is wrongly connected • Defective fuse • Drill chuck protection not closed	• Have it checked by authorised personnel • Close drill chuck protection
Motor is overheating and there is no power	• Motor overloaded • Too low mains voltage • Motor is wrongly connected	• Reduce feed rate Disconnect immediately and have it checked by authorized personnel • Have it checked by authorised personnel
Precision of the work deficient	• Irregularly heavy or tensed work-piece • Inexact horizontal position of the work-piece holder	• Balance the piece statically and secure without straining • Adjust workpiece-holder
Drilling spindle sleeve does not return to its initial position	• Spindle return spring does not work • Integrated drill drift (only DH 28 BV, DH 34 BV) is defective or clamped	• Check spindle return spring, replace it, if necessary • Check integrated drill drift, replace it if necessary

DHBV_GB_9.fm

Malfunction	Cause/ possible effects	Solution
The drilling spindle cannot be moved downwards. (only DH 28 BV, DH 34 BV)	• Integrated drill drift is in the position for ejecting • Drill depth adjustment no released	• Pull out integrated drill drift • Release drill depth adjustment
It is not possible to eject the tool with the integrated drill drift (only DH 28 BV, DH 34 BV)	• Integrated drill drift position No 78 ☞ „7.16 DH34BV | DH40BV - Bohrkopf - Drilling head“ on page 83 is broken, worn out, defective • Cylindrical pin position No.35 ☞ „7.16 DH34BV | DH40BV - Bohrkopf - Drilling head“ on page 83 is broken	• Replace component • Replace component
Temperature of spindle bearing is too high	• Bearing worn down • Bearing pretension is too high • Working at high drilling speed over a longer period of time.	• replace • Increase bearing clearance for fixed bearing (taper roller bearing) • Reduce drill speed and feed rate
Working spindle rattling on rough piece surfaces	• Excessive slack in bearing • Working spindle moves up and down • Clamping chuck is loose • Tool is blunt • Workpiece is loose	• Reduce bearing clearance or replace bearing • Readjust bearing clearance (fixed bearing) • Check, re-tighten. • Sharpen or replace tool • Clamp the workpiece firmly.

9 Appendix

9.1 Copyright

This document is protected by copyright. All derived rights are reserved, especially those of translation, re-printing, use of figures, broadcast, reproduction by photo-mechanical or similar means and recording in data processing systems, either partial or total.

Subject to technical changes without notice.

9.2 Terminology/Glossary

Term	Explanation
Drill drift	Tool to release the bit or the drill chuck from the drill spindle
Drill chuck	Drill bit adapter
Drill head	upper part of the drilling machine
Drill sleeve	fixed hollow shaft which runs in the drill spindle.
Drilling spindle	Shaft activated by the motor
Drilling table	Supporting surface, clamping surface
Taper mandrel	Cone of the drill or of the drill chuck
Spindle sleeve lever	Manual operation for the drill feed
Quick-action drill chuck	drill holding fixture to be clamped manually.
Workpiece	part to be drilled, part to be machined.
Tool	Milling cutter, drill bit, countersink, etc.

9.3 Change information operating manual

Chapter	Short summary	new version number
CE	EC declaration	1.0.1
2 + 4 + 5 + parts + CE	Machine type DH40BV integrated new EMC Directive, Low Voltage Directive	1.1.0
1 + 5	Advanced information on inspection schedules	1.1.0
1 + 2	Updated weight of DH40BV	1.1.1
parts	New table for DH28BV	1.1.2
3	Interdepartmental transport	1.1.3

9.4 Liability claims for defects / warranty

Beside the legal liability claims for defects of the customer towards the seller, the manufacturer of the product, OPTIMUM GmbH, Robert-Pfleger-Straße 26, D-96103 Hallstadt, does not grant any further warranties unless they are listed below or were promised in the framework of a single contractual provision.

- The processing of the liability claims or of the warranty is performed as chosen by OPTIMUM GmbH either directly or through one of its dealers.
  Any defective products or components of such products will either be repaired or replaced by components which are free from defects. Ownership of replaced products or components is transferred to OPTIMUM Maschinen Germany GmbH.
- The automatically generated original proof of purchase which shows the date of purchase, the type of machine and the serial number, if applicable, is the precondition in order to assert liability or warranty claims. If the original proof of purchase is not presented, we are not able to perform any services.
- Defects resulting from the following circumstances are excluded from liability and warranty claims:
  - Using the product beyond the technical options and proper use, in particular due to overstraining of the machine.
  - Any defects arising by one's own fault due to faulty operations or if the operating manual is disregarded.
  - Inattentive or incorrect handling and use of improper equipment
  - Unauthorized modifications and repairs
  - Insufficient installation and safeguarding of the machine
  - Disregarding the installation requirements and conditions of use
  - atmospheric discharges, overvoltage and lightning strokes as well as chemical influences
- The following items are also not subject to liability or warranty claims:
  - Wearing parts and components which are subject to a standard wear as intended such as e.g. V-belts, ball bearings, illuminants, filters, sealings, etc.
  - Non reproducible software errors
- Any services, which OPTIMUM GmbH or one of its agents performs in order to fulfil any additional warranty are neither an acceptance of the defects nor an acceptance of its obligation to compensate. Such services do neither delay nor interrupt the warranty period.
- Place of jurisdiction for legal disputes between businessmen is Bamberg.
- If one of the aforementioned agreements is totally or partially inoperative and/or invalid, a provision closest to the intent of the warrantor is considered agreed upon, which remains within the framework of the limits of liability and warranty which are specified by this contract.

9.4.1 Decommissioning

CAUTION!

Used devices need to be decommissioned in a professional way in order to avoid later misuses and endangerment of the environment or persons.

- **Disconnect the plug from the power supply.**
- **Cut the connection cable.**
- **Remove all environmentally hazardous operating fluids from the used device.**
- **If applicable remove batteries and accumulators.**
- **Disassemble the machine if required into easy-to-handle and reusable assemblies and component parts.**
- **Dispose of machine components and operating fluids using the intended disposal methods.**

9.5 Storage

ATTENTION!

Incorrect and improper storage might result in damage or destruction of electrical and mechanical machine components.

Store packed and unpacked parts only under the intended environmental conditions.

Follow the instructions and information on the transport box.

- Fragile goods (Goods require careful handling)

- Protect against moisture and humid environment

- Prescribed position of the packing case (Marking of the top surface - arrows pointing to the top)

- Maximum stacking height
  Example: not stackable - do not stack further packing cases on top of the first one.

- Consult Optimum Maschinen Germany GmbH if the machine and accessories are stored for more than three months or are stored under different environmental conditions than those specified here .

9.6 Note regarding disposal / options to reuse:

Please dispose of your machine in an environmentally friendly way, not by disposing of the waste not in the environment, but by acting in a professional way.

Please neither throw away the packaging nor the used machine later on, but dispose of them according to the guidelines established by your city council/municipality or by the corresponding waste management enterprise.

9.6.1 Disposal of new device packaging

All used packaging materials and packaging aids from the machine are recyclable and generally need to be supplied to the material reuse.

The packaging wood can be supplied to the disposal or the reuse.

Any packaging components made of cardboard box can be chopped up and supplied to the-waste paper collection.

The films are made of polyethylene (PE) and the cushion parts are made of polystyrene (PS). These materials can be reused after reconditioning if they are passed to a collection station or to the appropriate waste management enterprise.

Only forward the packaging materials correctly sorted to allow direct reuse.

9.6.2 Disposing of the old device

INFORMATION

Please take care in your interest and in the interest of the environment that all component parts of the machine are only disposed of in the intended and admitted way.

Please note that the electrical devices comprise a variety of reusable materials as well as environmentally hazardous components. Please ensure that these components are disposed of separately and professionally. In case of doubt, please contact your municipal waste management. If appropriate, call on the help of a specialist waste disposal company for the treatment of the material.

9.6.3 Disposal of electrical and electronic components

Please make sure that the electrical components are disposed of professionally and according to the statutory provisions.

The machine is composed of electrical and electronic components and must not be disposed of as household waste. According to the European Directive regarding electrical and electronic used devices and the implementation of national legislation, used power tools and electrical machines need to be collected separately and supplied to an environmentally friendly recycling centre.

As the machine operator, you should obtain information regarding the authorised collection or disposal system which applies for your company.

Please make sure that the electrical components are disposed of professionally and according to the legal regulations. Please only throw depleted batteries in the collection boxes in shops or at municipal waste management companies.

9.6.4 Disposal of lubricants and coolants

ATTENTION!

Please imperatively make sure to dispose of the used coolant and lubricants in an environmentally compatible manner. Observe the disposal instructions of your municipal waste management companies.

INFORMATION

Used coolant emulsions and oils should not be mixed up since it is only possible to reuse used oils without pre-treatment, if they have not been mixed.

The disposal instructions for used lubricants are made available by the manufacturer of the lubricants. If necessary, request the product-specific data sheets.

9.7 Disposal via municipal collection

Disposal of used electrical and electronic components
(Applicable in the countries of the European Union and other European countries with a separate collecting system for those devices).

The sign on the product or on its packing indicates that the product must not be handled as common household waste, but that is needs to be disposed of at a central collection point for recycling. Your contribution to the correct disposal of this product will protect the environment and the public health. Incorrect disposal constitutes a risk to the environment and public health. Recycling of material will help reduce the consumption of raw materials. For further information about the recycling of this product, please consult your District Office, the municipal waste collection station or the shop where you have bought the product.

9.8 Product follow-up

We are required to perform a follow-up service for our products which extends beyond shipment.

We would be grateful if you could send us the following information:

- Modified settings
- experiences with the bench drill and upright drill, which could be important for other users
- Recurring failures

Optimum Maschinen Germany GmbH
Dr.-Robert-Pfleger-Str. 26

D-96103 Hallstadt

Fax +49 (0) 951 - 96 555 - 888
email: info@optimum-maschinen.de

EC - Declaration of Conformity

according to Machinery directive 2006/42/EC, Annex II 1.A

The manufacturer / distributor Optimum Maschinen Germany GmbH
Dr.-Robert-Pfleger-Str. 26
D - 96103 Hallstadt, Germany

hereby declares that the following product

Product designation: Drilling machine

Type designation: DH24BV | DH28BV | DH34BV | DH40BV

fulfills all the relevant provisions of the directive specified above and the additionally applied directives (in the following) - including the changes which applied at the time of the declaration.

Description:

Hand-controlled drilling machine.

The following additional EU directives have been applied:

EMC Directive 2014/30/EU ; Restriction of the use of certain hazardous substances in electrical and electronic equipment 2015/863/EU

The following harmonized standards were applied:

EN 12717: 2001 - Machine tools - Safety - Drilling machines

EN 60204-1 - Safety of machinery - Electrical equipment of machines - Part 1: General requirements

EN 1837:1999+A1:2009 - Safety of machinery - Integral lighting of machines

EN 13849-1:2015 - Safety of machinery - Safety related parts of controls - Part 1: General design principles

EN 13849-2:2012 - Safety of machinery - Safety related parts of controls - Part 2: Validation

EN ISO 12100:2013 - Safety of machinery - General principles for design - Risk assessment and risk reduction

Name and address of the person authorized to compile the technical file:

Kilian Stürmer, phone: +49 (0) 951 96555 - 800

Kilian Stürmer (CEO, General Manager)
Hallstadt, 2019-12-11

Index

DH24BV_DH28BV_DH34BV_DH40BV_GBSIX.fm

Quellenverzeichnis von Ihrem Fachhändler Metallbau Mehner

Optimum Bohrmaschinen:

- OPTIdrill B 24 H HV
  - OPTIdrill B 24 H HV Ersatzteile
  - OPTIdrill B 24 H HV Zubehör

- OPTIdrill B 28 H HV
  - OPTIdrill B 28 H HV Ersatzteile
  - OPTIdrill B 28 H HV Zubehör

- OPTIdrill DH 24 BV
  - OPTIdrill DH 24 BV Ersatzteile
  - OPTIdrill DH 24 BV Zubehör

- OPTIdrill DH 28 BV
  - OPTIdrill DH 28 BV Ersatzteile
  - OPTIdrill DH 28 BV Zubehör

- OPTIdrill DH 34 BV
  - OPTIdrill DH 34 BV Ersatzteile
  - OPTIdrill DH 34 BV Zubehör

- OPTIdrill DH 40 BV
  - OPTIdrill DH 40 BV Ersatzteile
  - OPTIdrill DH 40 BV Zubehör

- OPTIdrill Zubehör

Ihr Ersatzteil nicht in den Listen?
Direkt zum >>**Formular Download**<<. Tragen sie Ihr Maschinenmodell, samt Bauteil und Artikelnr. und wir senden Ihnen ein Angebot zeitnah zu.

Allgemeine Betriebsmittel

- Öle und Schmiermittel
- Minimalmengenschmierung

Weitere interessante Verweise

- Fräsmaschinen / CNC Fräsmaschinen / CNC Steuerungen
- Drehmaschinen / CNC Drehmaschinen
- Drucklufttechnik / Kompressoren